

U.S. BEEF PRODUCERS' CURRENT USE
AND PERCEPTIONS OF SOCIAL MEDIA AS A
COMMUNICATIONS TOOL

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CHAPTER I

INTRODUCTION

Background and Setting

Information is one of the most valuable resources in the agricultural industry (Maddox, 2001) and “U.S. famers are insatiable consumers of information” (Boehlje & King, 1998, p. 21). Market instability, increasingly complex production technologies, and a growing need for financial planning and control have augmented farmers’ demand for information in recent years (Ortmann, Patrick, Musser, & Doster, 1993).

But what is information? Boehlje and King (1998) defined value-added information as the result of data (individual ideas and concepts) and knowledge (a tool for sorting data) being applied to a specific decision for a specific audience. Impact, specificity, and accessibility help determine the value of information, and “all three are required for the value of information to increase rapidly as we currently see in agricultural production and management decisions” (Boehlje & King, 1998, p. 25).

As the amount and value of available information simultaneously increase, the challenge becomes distributing that information in a more personal, specific manner (Boehlje & King, 1998). Technology is continually changing the way information is

disseminated from source to user, and has allowed information to become more audience-specific and decision-focused, answering the questions: “Who are the customers, what do they want, and when do they want it?” (Boehlje & King, 1998, p. 25).

The rapid adoption of the Internet and subsequent introduction of social media into the communications landscape has changed how many individuals seek and receive information. “Immediate access is a driving force in audience satisfaction” (Boehlje & King, 1998, p. 27). According to Park and Mishra (2003), communication technologies are an asset to the agricultural community as they “may reduce constraints on a farmer’s ability to receive and manage information” (p.1).

Just as the adoption of computers and the Internet took off in the 1990s (Rogers, 2003), the use of social media is now growing at an exponential rate (Hoffman, 2009). A 2009 study by the American Farm Bureau Federation found that of the 92% of farmers and ranchers surveyed who used computers, 46% regularly used some form of social media. Additionally, a recent study by Harris Interactive (2010) indicated that nearly nine out of ten online Americans (87%) used social media, and 57% of online adults said that social media helped them feel more connected to people.

Of course, not everyone has access to these communication technologies. The gap that separates the information-rich from the information-poor is known as the *digital divide* (Flor, 2002). Drivers of this gap may include: socioeconomic status, race, age, and geography (Rogers, 2003). Although the digital divide is somewhat of a concern in the agricultural industry, the technology disparity between rural and urban America is shrinking (NTIA, 2011). In a study of information sources used by large cornbelt farmers, Ortman et al. (1993) found that “Eighty percent of respondents were using computers in

their farm business” (p. 393). In another study regarding how Illinois pork producers are informed of new technologies, 89.7% of respondents indicated they owned or used a computer (Brashear, Hollis, & Wheeler, 2000). However, the same study found that although producers had access to the communication tools, only a small number were using them to access information (Brashear et al, 200).

The adoption of a new technology, such as social media, is driven by several factors, including socioeconomic status, personality variables, and communication behaviors (Rogers, 2003). Roger’s diffusion theory served as the theoretical basis for this study. The innovation-decision process guides an understanding of how social media has been and will continue to be adopted by U.S. beef producers, and adopter categorizations further clarify where producers fall relative to others in the adoption of communication technologies.

Statement of the Problem

“As the relative value of information increases, sources of that information are changing as well” (Boehlje & King, 1998, p. 22). Communication technologies, such as the Internet, have universally changed the way information is shared; the agricultural industry is no exception. In 1998 Boehlje and King predicted that Web-based communication systems, then only available to producers in their homes and offices, would “soon expand to their cars, trucks, tractors and combines” (p. 27). Just more than a decade later, this vision has become a reality. Vehicles, as well as agricultural machinery, come with options including global positioning systems (GPS), satellite radio, and other technologies that were not even thought of by producers of previous generations. With this increased competition in the information marketplace, understanding the

informational needs of agricultural producers has become critical (Diekmann & Batte, 2009).

Recently, social media has emerged as a popular and accepted platform for information sharing. According to Hoffman (2009) “Social media is sweeping the nation as well as the agricultural community” (para. 2). Social media tools present the opportunity for positive social engagement, potentially bridging the gap between producers and consumers (Hoffman, 2009). The growing prevalence of smart phones makes these tools accessible to producers 24 hours a day. These attributes of social media provide the potential for a constructive communication interface both within the agricultural industry and between agriculture and the general public. Not participating in social media can lead to missed opportunities (Lohr, 2011). For these reasons, there is a need to explore the current use and perceived credibility of social media as a communications tool within the agricultural industry, and specifically for this study, the U.S. beef industry.

Purpose

The purpose of this study was to determine U.S. beef producers’ current use and perceived credibility of social media as a communications tool.

Objectives

The objectives of this study were as follows:

1. Determine selected personal and professional characteristics (sex, age, education, size and type of cattle operation, role in cattle operation, and access to technology) of U.S. beef producers.
2. Determine U.S. beef producers’ preferred source(s) of information.

3. Determine U.S. beef producers' current use of social media.
4. Determine U.S. beef producers' perceptions regarding the credibility of information received via social media tools.
5. Determine how selected personal and professional characteristics (sex, education, and size of cattle operation) of U.S. beef producers relate to their preferred sources of information, use of social media, and perceived credibility of information received via social media tools.

Significance of the Study

Communication technologies have made the rapid dissemination of information possible. The Internet, and more recently social media, has further enhanced information sharing by connecting vast networks of individuals both seeking and sharing data. To be effective, however, those receiving information through various media channels must perceive the information to be credible.

By determining current social media use, interest in social media by non-users, and how credible producers believe information received via social media to be, this study will help agricultural communicators, beef industry organizations, and other agribusinesses understand social media's role in an overall communications strategy.

Assumptions

This study was conducted under the following assumptions:

1. The beef producers selected for this study had a general knowledge of the Internet and social media.

2. The selected beef producers honestly and accurately reported their preferred sources of information, current use of social media, and perceptions of information received via social media tools.

Limitations

Based on the scope and design of the study, the following limitations were identified:

1. By using only electronic mail for communication and a Web-based survey instrument, this study was biased toward producers who are users of at least basic communication technologies, such as the Internet and e-mail.
2. The results of this study cannot be generalized beyond the population of producers used for the study.
3. Although validity and reliability of the survey instrument were tested and accepted, the questionnaire was researcher-designed and thus subject to error.

Definitions of Terms

The following terms were defined for the purpose of this study:

Beef industry organization – any group, company, organization, or association whose primary purpose is to inform, support or promote the U.S. beef industry and the interests of producers within that industry.

Smart phone – a cell phone that includes additional software functions (as e-mail or an Internet browser) (Merriam-Webster Online, n.d.).

Social media – forms of electronic communication (as Web sites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (as videos) (Merriam-Webster Online, n.d.).

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter is a review of the relevant literature which provides context to the current study. An overview of the theoretical framework, Diffusions of Innovations, is provided and discussed as it relates to agricultural producers' adoption of communication technologies. Major sections of this literature review include: Information Needs of Agricultural Producers, the Role of Communication Technologies, Emergence of Social Media, and the Theoretical Framework. Relevant sub-sections fall under the four major headings and include: source preferences of agricultural producers, technology and effective communication, Internet use and the *digital divide*, social media and eWOM, social media and ROI, risks and benefits of social media, adoption of communication technologies, and implications of the theoretical basis for this study.

Information Needs of Agricultural Producers

Information is a critical component of the decision-making process for agricultural producers (Boehlje & King, 1998; Diekmann & Batte, 2009; Ortmann et al., 1993). As stated by Riesenberg and Gor (1989),

In today's agricultural industry, survival often depends on having an edge on information related to the market, efficient allocation of available resources, and use of new or innovative farming practices... The value of information as a commodity in today's information age cannot be overemphasized since it has contributed immensely to the stagnation or the progressiveness of many farming operations. (p. 7)

As the number of individuals working in agriculture decreases and production agriculture becomes more specialized, the relative value of information continues to increase. "As information becomes a more important source of strategic competitive advantage, those who have access to it will be more successful than those who do not" (Boehlje & King, 1998, p. 28). Along with the increasing value of information, Diekmann and Batte (2009) pointed to the rapid growth in the number and type of available information sources. Understanding the informational needs of farmers is vital in this competitive information marketplace (Diekmann & Batte, 2009).

Source Preferences of Agricultural Producers

Much research has been conducted regarding agricultural producers' preferred sources of information. Boehlje and King (1998) reasoned there has been a shift in the standard for information delivery: "We are now moving into an access paradigm providing customers with greater access to ever-increasing amounts of knowledge and data" (Boehlje & King, 1998, p. 27). However, this access paradigm does not necessarily correlate with an increase in the use of information and communication technologies among agricultural producers.

Research by Riesenberg and Gor in 1989 examined farmers' preferred channels of receiving information on new and innovative farming practices. The study found that farmers preferred more interpersonal interaction as opposed to the use of technology for receiving information. Similarly, Maddox, Mustian, and Jenkins (2003) found that for information regarding new farm management practices and day-to-day decision making, producers most preferred personal channels of information, followed by print sources; the Internet was placed among communication channels not used for seeking information. In a study titled *Assessment of Hybrid Rice Program in the Philippines*, Cidro and Radhakrishna (2006) examined the perceived usefulness of information sources in the promotion of the Hybrid Rice Program. They found that both extension agents and farmers rated print sources and technical experts as the most useful sources of information, while electronic sources were rated the least useful of all source groupings (Cidro & Radhakrishna, 2006). A study examining the usefulness of educational delivery methods as perceived by South Carolina longleaf pine landowners also revealed that the Internet was the least useful delivery method for educational information (Radhakrishna, Nelson, Franklin, & Kessler, 2003).

In a study of part-time and full-time beef producers, Obahayujie and Hillison (1988) found that while part-time beef farmers preferred interpersonal communication methods such as personal visits or on-farm demonstrations, full-time producers preferred mass media communication channels such as publications, radio programs, and bulletins. Based on his own work and the work of others, Ingle (1986) maintained there has been a shift from an emphasis on mass-media to personal media "because of the low-cost,

portable technology which the individual can control in terms of viewing/listening time, content and repeated exposure to a message” (p. 255).

Vergot, Israel, and Mayo (2005) examined Northwest Florida beef cattle producers’ preferences for both the source and channel of information. They found that other producers, Extension Agents, and veterinarians received the highest source ratings, while newsletters, farm magazines, and bullitins were the most preferred channels for receiving information (Vergot et al., 2005). Similarly, Ashlock (2006) found that Oklahoma beef producers preferred their veterinarian when seeking information regarding animal health or agriculturally related crises; county Extension publications were the preferred means of information dissemination.

The Role of Communication Technologies

Technology and Effective Communication

Ingle (1986) discussed in depth the role of media and technology in effective communication. He stated, “The use of all available and cost-effective media and technologies make possible appropriate communications for specific goals with specific audiences” (Ingle, 1986, p. 251). The use of existing and evolving communication technologies will lead to advances in education and socio-economic development by: reducing the negative effects of geographical barriers which limit access to current information and knowledge, increasing the effectiveness of society, and improving the productivity of fields including agriculture and rural development (Ingle, 1986).

“The question, therefore, should no longer be whether communication technology is useful, or for that matter, which particular medium is better, but rather how to use communication media effectively and at a reasonable cost” (Ingle, 1986, p. 253).

Ingle (1986) emphasized that appropriate content of the message being delivered is a key element of communication media, and in fact, should be encompassed in its definition. “The old adage ‘Technology is the answer, but what was the question?’ underscores the fact that communication media and technology are merely tools” (Ingle, 1986, p. 259). The effectiveness of these communication tools depends upon many other factors, including “the relevance and accuracy of the information these media will disseminate” (Ingle, 1986, p. 259).

Internet Usage and the “Digital Divide”

Broadband Internet access in U.S. households has grown 17% since 2007, reaching over two-thirds of American households today (NTIA, 2011). In addition, approximately 209.4 million Americans (71.7%) age three and older use the Internet somewhere, regardless of access at home (NTIA, 2011). This is significant for the American economy, as an econometric study performed by the Economic Development Administration (EDA) found broadband access enhances economic growth and performance (Gillett, Lehr, Osorio, & Sirbu, 2006).

“The rapid diffusion of broadband Internet in the United States relative to other major technologies over time underscores how important this infrastructure is to Americans” (NTIA, 2011, p. 2). However, although the growth of Internet adoption spans across all demographic sectors, there are still many without access to high-speed Internet (NTIA, 2011). Dillman (2007) stated that “people who live in higher income areas of the United States or in places that are more densely populated typically have better connections because of better ISP access as well as telecommunications infrastructure” (p. 357). This disparity is known as the *digital divide* and can result from many factors,

including socioeconomic status, race, age, gender, education and geography (NTIA, 2011; Rogers, 2003). It is important that this gap is addressed so no one is left behind in the digital information age (NTIA, 2011).

The technology gap between rural and urban areas, which has a specific impact on agricultural populations, is steadily decreasing. The differential of in-home broadband access between rural and urban American decreased from 15% in 2007 to 10.1% in 2010 (NTIA, 2011). Figure 1 from the National Telecommunications and Information Administration shows continued convergence between 2009 and 2010.

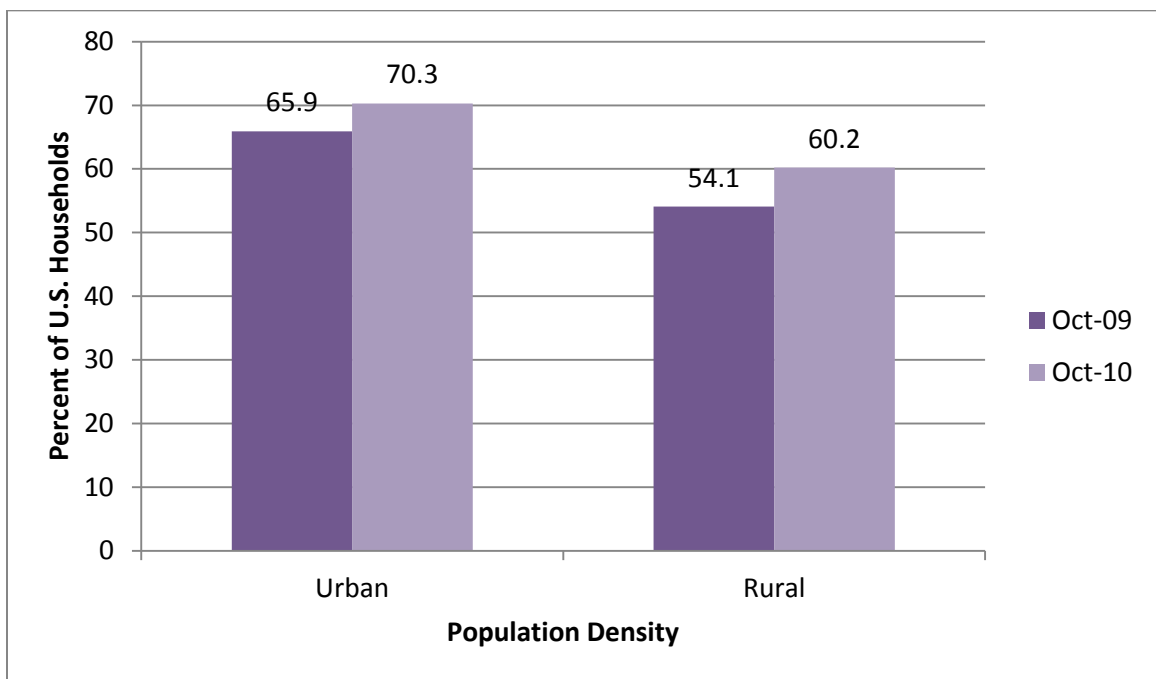


Figure 1. Percent of U.S. households using broadband in the home by population density. Adapted from “Digital Nation: Expanding Internet Usage,” by the National Telecommunications and Information Administration, p. 16.

When considering Internet use anywhere, including out-of-home use, the urban–rural gap decreased from 4.4% in 2009 (69.3% versus 64.9%) to 3.6% in 2010 (72.4%

versus 68.8%) (NTIA, 2011). The most common reason for non-adoption of broadband among both urban and rural populations was “don’t need/not interested” (NTIA, 2011). However, lack of broadband availability was cited as a more common barrier to Internet adoption in rural areas (9.4% versus 1.0%). Figure 2 outlines the reasons given by both rural and urban populations for not having broadband access at home.

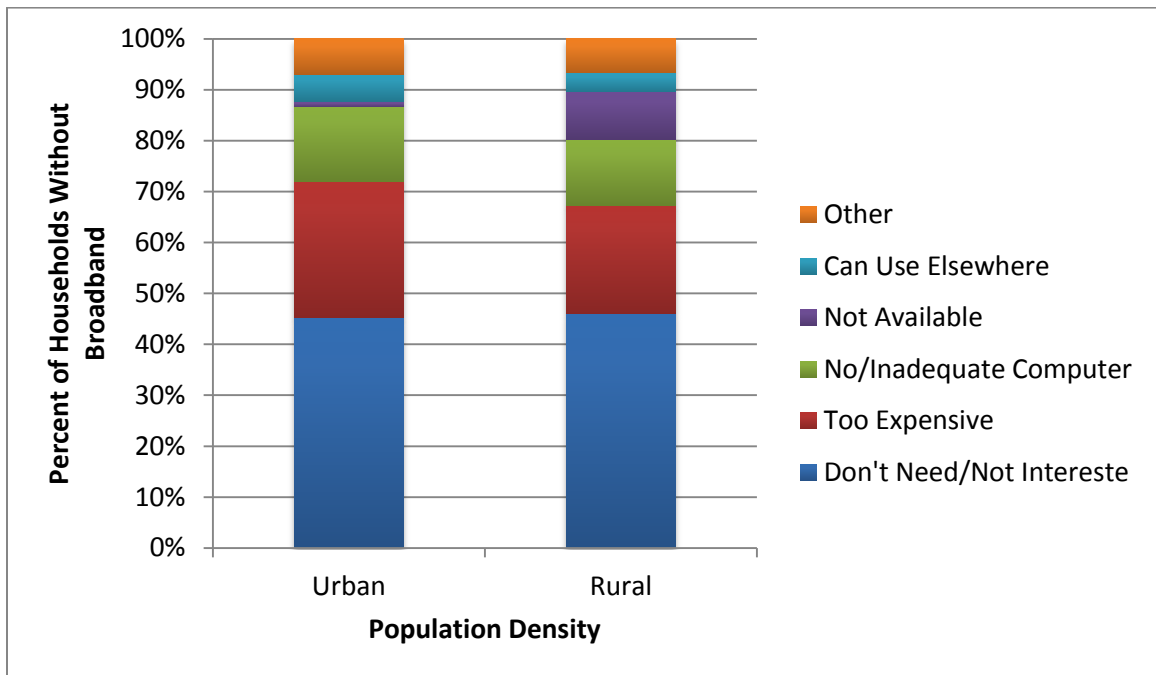


Figure 2. Main reasons for no high-speed internet use at home by population density. Adapted from “Digital Nation: Expanding Internet Usage,” by the National Telecommunications and Information Administration, p. 24.

Another phenomenon that merits discussion is the intra-rural digital divide. Koutsouris (2010) maintained that while access to relevant information and knowledge is critical for the sustainable development of rural areas, the role of information and communication technologies (ICTs) is still contentious. In addition to the urban-rural digital divide, a divide also exists between certain rural communities and between

individuals within rural communities (Donnermeyer & Hollifield, 2003). Furthermore, various studies have indicated that even with access to the necessary hardware, such as computers, ICTs are generally less preferred by agricultural producers than other sources of information (Brashear et al, 2000; Diekmann & Batte, 2009; Lasley, Padgitt, & Hanson, 2001; Vergot et al., 2005). According to Flor (2002), “The agricultural sector has lagged behind in exploring and tapping the potentials that information and communication technology has to offer” (para. 2). This could put these producers at a disadvantage.

Emergence of Social Media

According to Kaplan and Haenlein (2010), the idea of social media is not a new concept in communication technologies. The beginning of social media-type networks dates back to approximately 1959, “when Bruce and Susan Abelson founded ‘Open Diary,’ an early social networking site that brought together online diary writers into one community” (Kaplan & Haenlein, 2010, p. 60). It was also around this time the term “weblog” was developed, which was later shortened to the term “blog” used today (Kaplan & Haenlein, 2010).

In recent years, the concept of social networking has begun to proliferate. MySpace became prominent in 2003, with Facebook following shortly in 2004 (Kaplan & Haenlein, 2010). Seventy-five percent of Internet users participated in some form of social networking in the second quarter of 2008, and as of January 2009 Facebook had registered more than 175 million users (Kaplan and Haenlein, 2010).

Social Media and eWOM

Social media is differentiated from more traditional media in that its content is predominantly consumer driven (Smith, 2009).

Over the last few years the web has fundamentally shifted towards user-driven technologies such as blogs, social networks and video-sharing platforms.

Collectively these social technologies have enabled a revolution in user-generated content, global community and the publishing of consumer opinion, now uniformly tagged as social media. (Smith, 2009, p. 559)

Along with the development of social media and user-driven technologies came the growth of personal influence via cyberspace, known as electronic word of mouth (eWOM) (Goldsmith & Horowitz, 2006). Jansen, Zhang, Sobel, and Chowdury (2009) defined eWOM as a “statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the internet” (p. 2170).

There are five fundamental differences that separate online communication from traditional forms of communication:

- the range of possibilities for information exchange;
- the anonymity and confidentiality inherent to virtual communication;
- the absence of physical cues used to assess others;
- freedom from geographic limitations and time constraints; and
- the permanence of conversations and interactions online (Goldsmith & Horowitz, 2006).

Jansen et al. (2009) expressed similar ideas regarding social networking and online communication: “eWOM may be less personal in that it is not face-to-face...but it is more powerful because it is immediate, has a significant reach, is credible by being in print, and is accessible by others” (p. 2170).

Brand image and awareness, which in turn affect consumer purchases of products both directly and indirectly, can be influenced by eWOM (Jansen et al., 2009). Jansen et al. (2009) reported a study done by Park and Lee (2009) that found negative eWOM has a greater effect than positive eWOM. Collaboration is an important attribute of social media, and because social networking sites play a key role in the dissemination of eWOM, social networking of consumers will have a significant impact on negative or positive brand image (Jansen et al., 2009).

Social Media and ROI

Fisher (2009) discussed the use of return on investment (ROI) for the purpose of measuring the effectiveness of social media marketing.

Return on investment (ROI) has become the Holy Grail of social media.

Marketers are being squeezed between admonishments to participate in the vast new online communications available to them and demands to justify the cost using conventional advertising metrics. (Fisher, 2009, p. 189)

However, a consistent and agreed upon method for measuring ROI of social media has not been established. In fact, inability to measure the economic return on social media marketing was named as one of the most significant barriers to its adoption (Fisher, 2009). This is a significant and potentially costly barrier as Fisher (2009) also emphasized that “Social media is where your actual and potential customers are

interacting, and it shapes how they think...A customer's value is not equal to how much they spend at your store. It's far more" (Fisher, 2009, p. 190).

According to Fisher (2009), one of the most pressing reasons for companies to become involved in social media marketing is that their competitors are already doing it. Social media is a very public forum for communication, and absence of participation is noticed by consumers and competitors alike (Fisher, 2009).

Regardless of the apparent need to be involved in social media, measurement of the effectiveness of social media marketing is still in question. Some feel that social networking is more about fostering relationships – and thus building customer loyalty, as opposed to seeking profits, should be the goal (Fisher, 2009). However, many profit-driven companies are demanding that some form of progress be gauged to ensure the effectiveness of resources directed toward social media.

Risks and Benefits of Social Media

“A rumor, a political message, or a link to an online video—these are all examples of information that can spread from person to person, contagiously, in the style of an epidemic” (Kleinberg, 2008, p. 69). This statement is indicative of the risks and benefits inherent to the use of social media as a communications tool. Depending on the content of the message being disseminated, social media can make or break a company's reputation. Businesses, organizations, and individuals alike must be aware of both positive and negative consequences before deciding to participate in social networking.

Social networks present a forum for communication that is viral in nature. “The viral quality of social media makes it an appealing way for businesses to market products and services, and marketers have long recognized and tapped the potential of social

media outlets” (Steinman & Hawkins, 2010, p. 1). However, this viral quality of social media also leads to inherent risk. As stated by Steinman and Hawkins (2010), “Companies using the power of social media must be cognizant of the relevant legal issues in order to protect themselves from liability risks” (p. 1).

Trademark and copyright protection are two factors companies must consider in protecting their reputation and integrity online (Archie, Barry, & Olson, 2009; Steinman & Hawkins, 2010). By monitoring not only their own social media outlets but also those of others, companies can ensure that their intellectual property is not being misused (Steinman & Hawkins, 2010). Name squatting, or third parties who register popular trademarks and company names for personal gain, can cause major damage to a company’s reputation. “This form of business impersonation can damage a company’s brand and reputation if left unchecked; such monitoring can also serve as a positive indicator of business success” (Steinman & Hawkins, 2010, p. 1).

One social media tool, Twitter, does provide specific company provisions to protect trademark holders, as well as maintaining a trademark policy in line with the Lanham Act, the federal trademark infringement and dilution statute (Archie et al., 2009; Steinman & Hawkins, 2010). Additional legal issues discussed by Archie et al. (2009) and Steinman and Hawkins (2010) include: intellectual property infringements, trade secret protection, unfair competition, and privacy issues.

Benefits of social media, many of which have already been mentioned, include building customer relationships, enhancing company image, and spreading positive eWOM (Burgess, 2010; Jansen et al., 2009; Kaplan & Haenlein, 2010). “Social media allow firms to engage in timely and direct end-consumer contact at relatively low cost

and higher levels of efficiency than can be achieved with more traditional communication tools” (Kaplan & Haenlein, 2010, p. 67). Additionally, most social networking sites are free for all users, including corporations seeking a venue for free marketing (Archie et al., 2009). This raises questions about how social media will remain a viable medium into the future.

Theoretical Framework

Several theories have been used to examine and explain the nature of technology adoption. Technology Acceptance Model (TAM), Social Learning Theory, and Computer Self-Efficacy (CSE) are all models discussed in the literature on the subject of acceptance and adoption of Web-based information and communication technologies. One of the leading theories regarding the adoption of new innovations, and the theoretical basis for this research, is Rogers’ Diffusion of Innovations.

Rogers (2003) defined diffusion as “the process in which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). It is a type of social change driven by a new idea. As Rogers (2003) heeds, sometimes getting a new idea adopted can be a challenge, regardless of the benefits.

According to Griffiths (2002), the Internet is a series of innovations that facilitates communication between computers in various locations. Viewing the Internet, and more specifically social media, as a technological innovation in communication, diffusion theory can be used to understand how certain individuals and social systems adopt and implement this relatively new platform for sharing and seeking information.

As a person decides whether or not to adopt a new idea or technology, they progress through a series of steps, collectively called the innovation-decision process (see Figure 3).

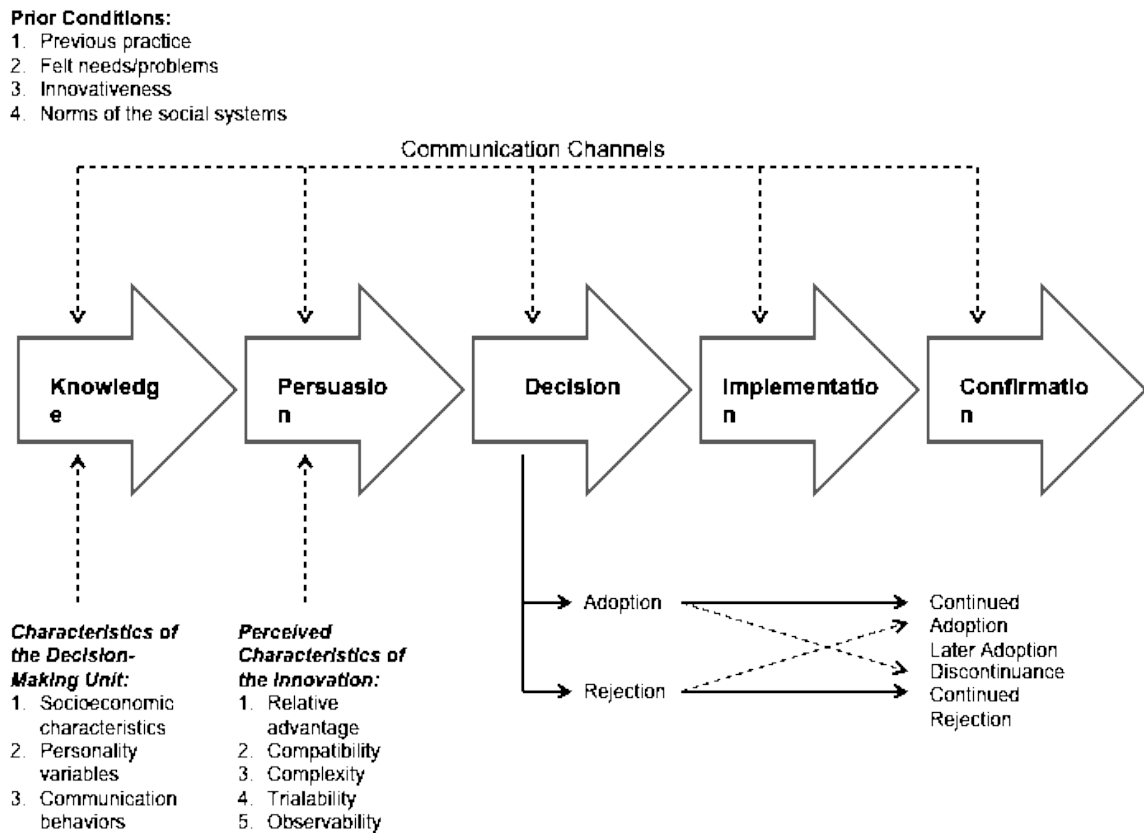


Figure 3. A model of the five stages in the Innovation-Decision process. Adapted from *Diffusions of Innovations* (5th ed.), by E. M. Rogers, p. 170. Copyright 2003 by E. M. Rogers.

There are five stages in this process: gaining *knowledge* of or exposure to the innovation; *persuasion*, or the development of a favorable or unfavorable attitude toward the innovation; the *decision* to adopt or reject the innovation; *implementation* of the new idea; and finally, *confirmation*. During the confirmation stage, “an individual seeks reinforcement of an innovation-decision already made, but he or she may reverse this

previous decision if exposed to conflicting messages about the innovation” (Rogers, 2003, p. 169).

Individuals are as unique as the innovations they encounter, and as such, not everyone will adopt new ideas at the same rate. Innovativeness, the underpinning behavior of the diffusion process, refers to an individual’s willingness to try and ultimately adopt a new idea (Atkin, Jeffres, & Neuendorf, 1998; Rogers, 2003). This individual readiness to adopt can also affect the aggregate rate of adoption of a new technology into a social system. Rogers (1995) describes five attributes of an innovation, as perceived by individuals, which affect its rate of adoption: relative advantage, compatibility, complexity, trialability, and observability. These attributes, along with other variable affect rate of adoption, are outlined in Figure 4.

Innovativeness also serves as the criterion for adopter categorization, a classification system created and first published by Rogers in 1958 (Rogers, 2003). During his studies as a doctoral student at Iowa State University, Rogers was also working toward a minor in statistics; frustrated by the “confusing disarray of terms used for adopter categories and the looseness of methods of categorization” (p.279), he decided to apply the concept of means, standard deviations, and normal distribution to explain and define adoption categories (see Figure 5).

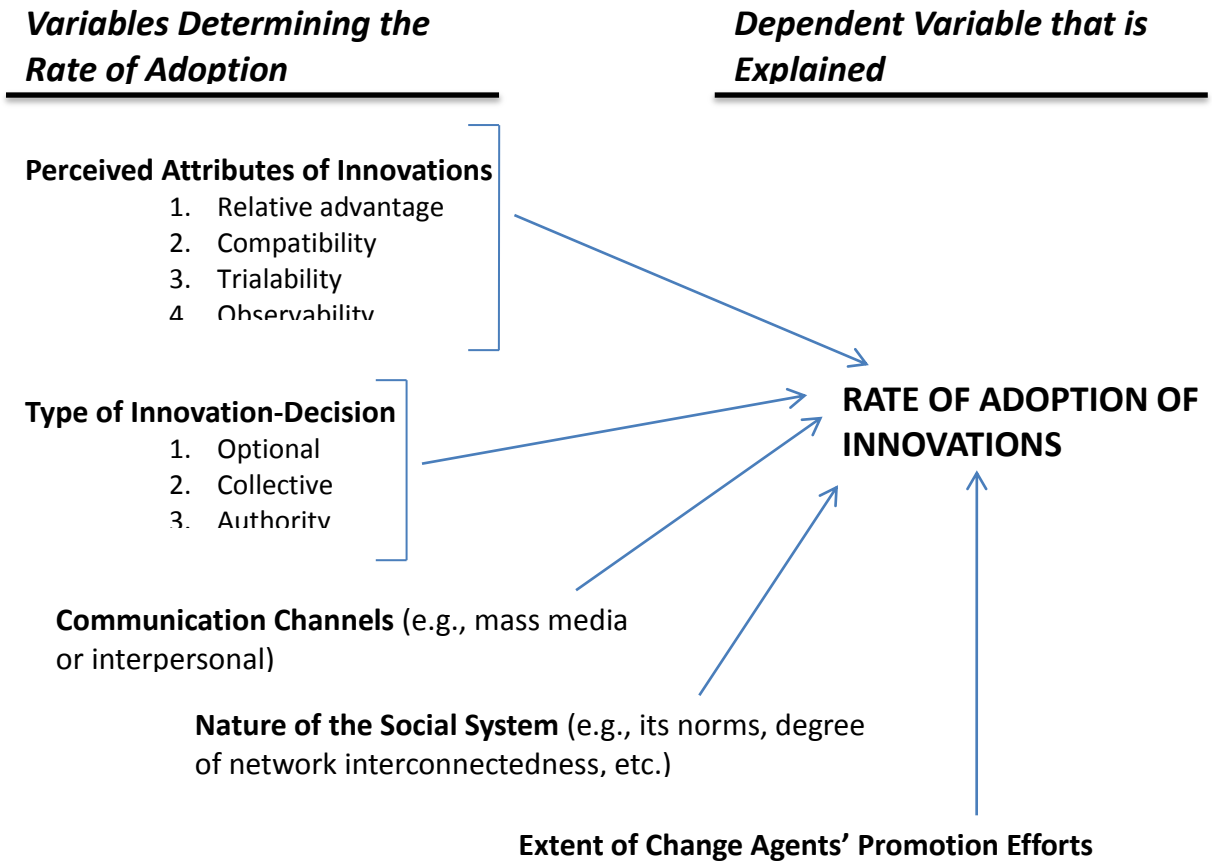


Figure 4. Variables determining the rate of adoption of innovations. Adapted from *Diffusions of Innovations* (5th ed.), by E. M. Rogers, p. 222. Copyright 2003 by E. M. Rogers.

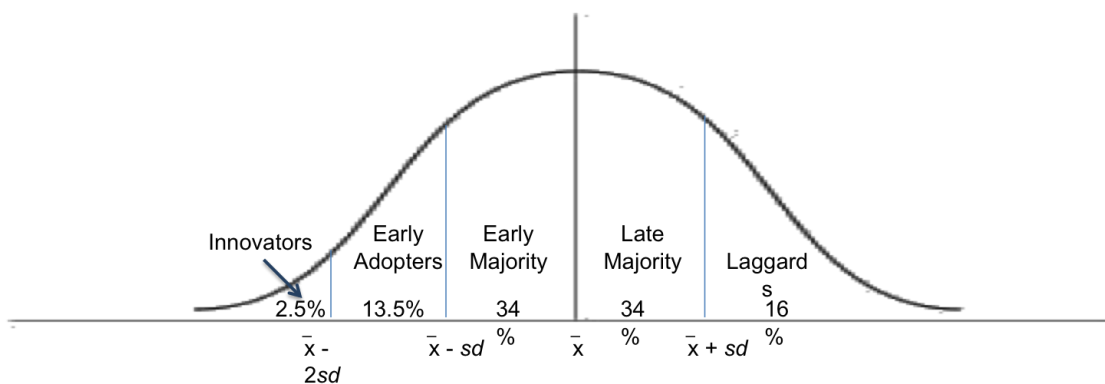


Figure 5. Adopter categorization on the basis of innovativeness. Adapted from *Diffusions of Innovations* (5th ed.), by E. M. Rogers, p. 281. Copyright 2003 by E. M. Rogers.

Earlier and later adopters of innovations often exhibit differences in socioeconomic status, personality variables, and communication behaviors (Rogers, 2003). According to Rogers (2003), earlier adopters tend to have more years of formal education, larger-sized units (such as farms), and a higher social status. Further, earlier adopters have a greater ability to cope with uncertainty and risk, have greater exposure to mass media and interpersonal communication channels, and engage in more active information seeking (Rogers, 2003).

Adoption of Communication Technologies

The Internet has been one of the most rapidly and wildly adopted technologies in the history of our society (Goodman et al., 1998; Rogers, 2003). Reagan (1987), as cited in Atkin et al. (1998), found that “adoption of a given media innovation is most powerfully related to adoption of other technologies” (p. 477). Interactive media such as e-mail, teleconferencing, and now social media are considered *interactive communication technologies*. According to Rogers (2003), such interactive technologies display a distinctive quality in rate of adoption called the *critical mass*. “The critical mass occurs at the point at which enough individuals in a system have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining” (Rogers, 2003, p. 343).

But why does this occur? The very nature of interactive media creates interdependence among adopters. “An interactive innovation is of little use to an adopting individual unless other individuals with whom the adopter wishes to communicate also adopt” (Rogers, 2003, p. 343). Further, interactive communication technologies possess a *reciprocal interdependence* in that “the benefits from each additional adoption of an

interactive innovation increase not only for future adopters, but also for each previous adopter” (Rogers, 2003, p. 344).

Implications for this Study

It is likely that agricultural producers are at various stages in the innovation-decision process regarding the adoption of social media. Many may have knowledge of the communication technology, but have not taken any further steps in developing a particular attitude, deciding to adopt or reject social media as a communications tool, or fully implementing its use. Others may have progressed through all five steps and decided to either continue implementation or reverse their initial innovation-decision based on positive or negative reinforcement. And it is likely that at least a handful of producers have not even entered the innovation-decision process due to lack of exposure to social media tools.

The five attributes that affect the rate of adoption of an innovation must also be considered regarding the diffusion of social media in the agricultural industry. Below, each of these factors is discussed as it relates to the adoption of social media by the producers in this study.

Relative advantage.

Rogers (2003) defined relative advantage as “the degree to which an innovation is perceived as being better than the idea it supersedes” (p. 229). This can be expressed in terms of economic profitability, social status or prestige, or some other advantage.

Social media certainly has a relative advantage over other forms of communication based on economic factors. Currently, the majority of social networking sites do not charge an access fee, and use is unlimited (Archie et al., 2009). As opposed

to paying for a monthly or weekly subscription to a print publication, a producer could find and link to the same information on the Internet free of charge. Accessing online articles directly (without the use of social media) would also be possible; however, the networking attribute of social media presents an opportunity to be exposed to a greater depth and breadth of information on the Web.

Compatibility.

Regarding the compatibility of an innovation, Rogers (2003) stated, “An idea that is more compatible is less uncertain to the potential adopter” (p. 240). This points to uncertainty reduction theory and the human instinct to avoid or attempt to reduce uncertainty. Berger and Calabrese (1975) defined uncertainty as “the cognitive inability to predict and/or explain our own and other people’s attitudes, feelings, values, and behavior” (p. 21). Interacting via social media can cause uncertainty in two ways. First, an individual may be uncertain about how to actually use social media tools. The learning curve for this type of technology may be a deterrent for those who wish to reduce or avoid uncertainty in communicating. Uncertainty may also exist in interacting with another person or persons through an exclusively electronic medium. As discussed by Goldsmith and Horowitz (2006), two features of online communication are anonymity and the absence of physical cues to assess others and the situation. These attributes add uncertainty to online communication technologies, and as such may dissuade some users.

Complexity.

Complexity refers to the perceived level of difficulty in using a new technology; it is negatively related to rate of adoption (Rogers, 2003). According to Rogers (2003), complexity was a negative force against the adoption of computers in the 1980s, and

many adopters became frustrated throughout the learning process. The perception of complexity may deter producers' from adopting social media as a communications technology, as they are already comfortable with more traditional methods of receiving information.

Trialability

Trialability is another attribute where social media offers a great advantage, as anyone can experiment using various social media tools with few negative repercussions. After the persuasion and decision stage, if an individual decides not to adopt this communications technology, the only thing lost is time. Trialability is a particularly important attribute for early adopters because it helps reduce the uncertainty that may prevent innovation adoption (Rogers, 2003). One barrier that could prevent producers from using social media even on a trial-basis is accessibility; access to a computer or the Internet is not always a reality.

Observability

If the positive results of an innovation are easily visible to others, rate of adoption will increase (Rogers, 2003). Specifically regarding technological ideas, such as social media, there are two components to consider: (a) the hardware that embodies the technology, and (b) the software, or virtual aspect of the tool (Rogers, 2003). If producers cannot see social media being used in a way that is beneficial, they may never find interest in using it themselves.

Chapter Summary

To remain viable and productive, agricultural producers must be on the cutting edge of production technology and information accessibility (Maddox et al., 2003).

Currently, although a growing number of producers have access to the tools necessary to utilize information and communication technologies, their adoption of these technologies is lagging (Brashear et al., 2000; Flor, 2002; Smith, Paul, Goe, & Kenny, 2004). As agricultural producers move through the innovation-decision process, they will need positive reinforcement through observability to move forward in the adoption process (Rogers, 2003). To aid in the adoption of new communication technologies and methods of receiving information, "...more attention will have to be given to educating farmers and other agriculturalists to become more competent and confident in using the new information sources..." (Riesenberg & Gor, 1989, p. 13).

CHAPTER III

METHODOLOGY

Introduction

This chapter provides a description of the methods used to conduct the study. Included herein are the approval of the study by the Oklahoma State University Institutional Review Board, the definition of the research design, a description of the population and sample, and the process of data collection and analysis.

Institutional Review Board

Federal regulations and Oklahoma State University policy require approval of all research studies that involve human subjects before investigators can begin their research. The Oklahoma State University Office of University Research Services and the Institutional Review Board (IRB) conduct this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with this policy, this study was reviewed by the OSU Institutional Review Board and received approval on July 15, 2011. The IRB application number assigned to this study was AG1139 (see Appendix A).

Research Design

This research used a descriptive survey methodology to determine U.S. beef producers' current use and perceptions of social media as a communications tool. As defined by Best (1970):

Descriptive research describes and interprets what is. It is concerned with conditions or relationships that exist; practices that prevail; beliefs, points of view, or attributes or relationships that are held; processes that are going on, effects that are being felt; or trends that are developing. The process of descriptive research goes beyond the mere gathering and tabulation of data. It involves an element of analysis and interpretation of the meaning of significance of what is described. (p. 116)

Descriptive research methodology was selected for this study to analyze not only the trend of social media use among U.S. beef producers, but also the relationships between various attributes of those producers as they relate to communication preferences, social media use, and perceptions of information shared via social media tools.

Data was collected via a Web-based questionnaire developed and distributed through Qualtrics Survey Software. As observed by Schonlau, Fricker, & Elliot (2002) "low cost personal computers and the explosive growth of the Internet during the past decade have introduced new methods of conducting research surveys" (p. iii), including the use of Web-based questionnaires. Although e-mail was explored as a survey mode in the late 1980s, Web surveys did not grow in popularity until the mid-1990s, the same

time Internet was becoming more accessible to the general population (Schonlau et al., 2002).

According to Dillman (2007), the use of electronic survey methods has the potential to bring great efficiencies to the design and management of self-administered questionnaires, including the “nearly complete elimination of paper, postage, mailout, and data entry costs” (p. 352). In addition, the use of electronic survey methods provides researchers the opportunity to overcome geographical barriers in conducting national and even international surveys (Dillman, 2007). However, Internet-based surveys are not without their drawbacks.

One of Dillman’s (2007) main concerns with surveys conducted on the Internet related to error caused by inadequate coverage. “The enormous potential for e-mail and Web surveys must be balanced against an equally large weakness” (Dillman, 2007, p. 354), chiefly the lack of access to computers and/or the Internet in many U.S. households. Schonlau et al. (2002) also noted coverage as a concern and added that “in the case of Internet surveys, access is not the only issue affecting coverage” (p. 15). Other concerns include the compatibility of respondents’ computer hardware and software; variation in transmission capabilities based on telecommunications infrastructure, namely the digital divide; and indirect effects of respondents’ computer literacy (Dillman, 2007; Schonlau et al., 2002).

Although Dillman (2007) and Schonlau et al. (2002) stated concerns regarding coverage error, Schonlau et al. also noted that “the fraction of the population with Internet access and the skills and hardware necessary to use the Web is continually increasing” (p. 29) and “the coverage differential is rapidly decreasing and may become

immaterial in the near future” (p. 29). Figure 6 from the National Telecommunications and Information Administration (2011) supports Schonlau et al. (2002), showing that the percentage of U.S. households with Internet access grew from 18.6% in 1997 to 71.1% in 2010.

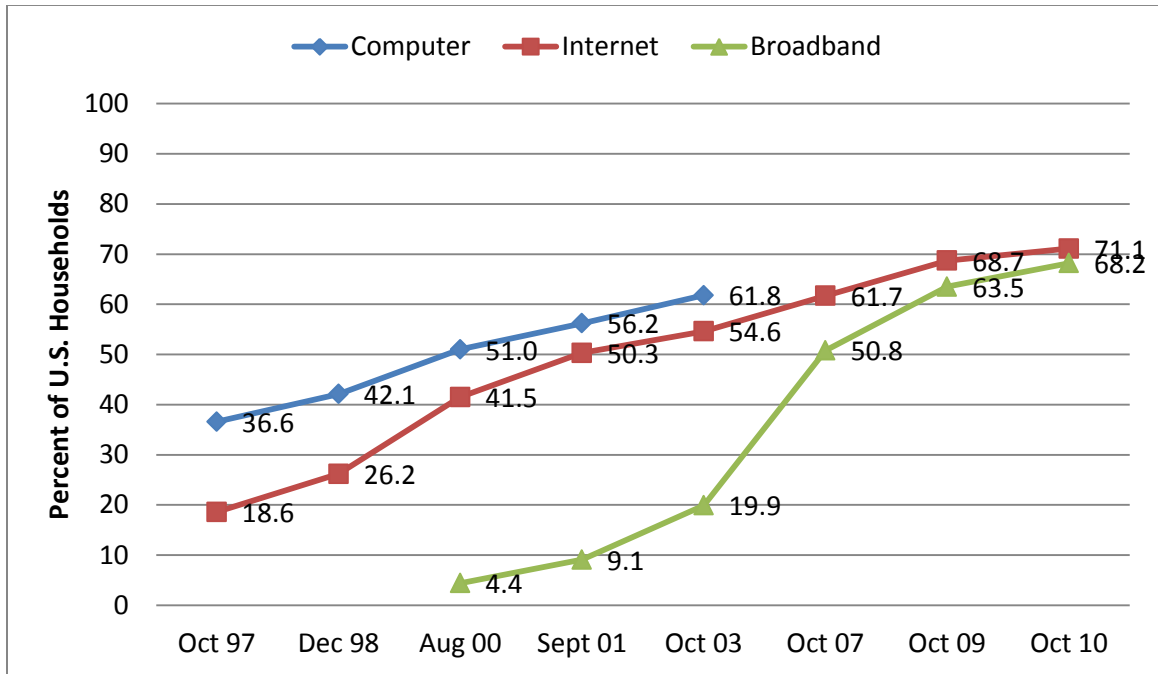


Figure 6. Households with computer, internet, and broadband access for selected years between 1997-2010. Adapted from “Digital Nation: Expanding Internet Usage,” by the National Telecommunications and Information Administration, p. 7.

Population & Sampling Procedures

This study used a probability sample drawn from a closed population. The target population was composed of beef producers who: (a) belonged to Drovers/CattleNetwork in 2011; (b) had a valid e-mail address on account with the publication; and (c) had not opted-out of third party contact. Drovers/CattleNetwork, America’s beef business source, reaches 91,000 qualified and audited beef producers via print each month, and 65,000

online readers who view 450,000 pages on a monthly basis (Drovers/CattleNetwork, 2011). Producers were considered qualified if they owned 100 cows, 100 stockers, or 500+ fed cattle. For this study, producers who were involved exclusively in a feedlot operation and those without a valid e-mail address were excluded from the sample frame. A total of 6,201 individuals met these criteria. A random sample of this group was selected by Drovers/CattleNetwork using a random nth selection, starting at record number one. Drovers/CattleNetwork conducted the random sampling procedure in-house to protect their asset of a subscribership list.

The random sample for this study, based on the aforementioned survey population, was drawn in accordance with Krejcie and Morgan's (1970) table for determining sample size. Given a survey population of N=6,201, the table suggests a minimum sample size of n=364 to achieve a 95% confidence level and a sampling error of +/- 5%. The population for this study was over-sampled (n=500) to compensate for a predicted low response rate. By over-sampling, the researcher's aim was to obtain a larger number of overall responses from the selected sample of producers.

Instrumentation

A researcher-designed questionnaire consisting of 20 items was created to address the objectives of this study (see Appendix B). The instrument was reviewed by a panel of experts to ensure face and content validity, and a pilot study conducted with industry professionals was used to establish reliability of the questionnaire.

Questionnaire Design

Survey responses for both the pilot and full research study were collected via a Web-based questionnaire designed according to the Dillman Tailored Design Method

(2007). Dillman (2007) takes a “less is more” approach in designing surveys for the Web. His suggestions included: limiting the use of color and other visual elements that may be affected by various operating systems and browsers; introducing the questionnaire with a motivational and informational welcome screen; and choosing a straightforward yet interesting first question that is applicable to all respondents (Dillman, 2007). Schonlau et al. (2002) also listed several design and implementation strategies for Internet surveys similar to Dillman including: requiring authentication to limit survey access to only those in the survey sample; only forcing answers to progress in the questionnaire when absolutely necessary; ensuring respondents’ protection of privacy (i.e., establishing trust); and providing some visual indicator of survey progress. While Schonlau et al. (2002) and Dillman (2007) agreed on most elements of survey design, they did differ in one area. Dillman (2007) recommended that a questionnaire scroll from top to bottom on a single page, “a method that most closely resembles the general experience of using the Web” (p. 395). On the other hand, Schonlau et al. (2002) suggested listing only a few questions per screen.

For this questionnaire, only one question was listed per screen. This format was used in part due to the skip logic created using Qualtrics Survey Software, which allowed for survey respondents to be directed to different sets of questions based on their answers to certain *sorter* questions. Questionnaire results collected via this survey software were stored in *the cloud* and then exported to SPSS and Excel for complete data analysis.

With the advanced branching and skip logic offered by Qualtrics, the questionnaire for this study was branched into two main categories: social media user and non-social media user; each subset of respondents then answered questions from three

categories: reasons for social media use (or non-use), perceived credibility of information received via social media, and demographic information.

Two filter questions at the beginning of the questionnaire, one ranking-type and one multiple choice question, divided the respondents into their respective branches. If a respondent indicated that they currently used some type of social media tool(s), that respondent was filtered to questions regarding his type and level of social media use. If the respondent indicated that they did not use any type of social media tools, that respondent was directed to a set of questions devised to determine reasons for non-use and potential levels of interest in using social media. If respondents indicated they had no interest in social media, they were sent directly to the demographic section of the questionnaire.

Questions regarding producers' current use of social media tools consisted of two multiple choice and one five-point Likert-type question. Respondents who indicated they did not use social media were further divided into two groups: those who were interested in social media and those who were not. A Likert-type question was used to determine with whom respondents might be interested in interacting with, should they start using social media. A multiple choice question also asked non-users to indicate for what purpose(s) they might want to use social media. Two questions regarding the credibility of information received via social media, one five-point Likert-type and one ranking question, were asked of both users and non-users of social media.

Demographic questions were used to address the fifth objective, which was to determine how personal and professional characteristics of U.S. beef producers relate to their preferred communication methods, use of social media, and perceived credibility of

information received via social media tools. In this section, four dichotomous choice and four multiple choice questions were used to determine producers' size and type of cattle operation and their role in the given operation. In addition, a fill in the blank question was used to determine the respondents' age and a drop-down list indicated the respondents' highest level of education.

Validity

As suggested by Tuckman (1978), a panel of experts reviewed the instrument to establish face and content validity. The panel included: three faculty members from the College of Agricultural Sciences and Natural Resources at Oklahoma State University, four industry experts from Certified Angus Beef LLC and Drovers/CattleNetwork, and two educational professionals outside of the beef industry (see Appendix C). After reviewing the instrument, panel members discussed suggestions for improvement with the primary researcher. Suggestions primarily related to general style/flow and specific wording of certain questions. Revisions were made and the panel found the questionnaire to be valid for this research.

Reliability

“Measurements can be reliable without being valid, but they cannot be valid unless they are reliable” (Campbell & Stanley, 1996, p. 48). After establishing face and content validity, reliability of the survey instrument was tested through a pilot study. The pilot study panel included 35 members of the American Angus Association Board and Regional Managers. This panel was selected because of their similarity to the target population.

Members of the pilot study received a pre-notification e-mail from a Certified Angus Beef representative (Appendix D) on July 18, 2011, to explain the purpose of the study and encourage participation. First round e-mails were sent on July 21, 2011, with two reminder e-mails following on July 25 and August 1, 2011. The pilot study was closed on August 11, 2011.

Seventeen of the 35 panel members responded to the questionnaire, resulting in a response rate of 48.6%. Data from the pilot study were used to calculate a Cronbach's alpha for scaled data. The Cronbach's alpha coefficient is a measure used to estimate the internal consistency of attitude scales; a coefficient of .70 or higher is usually preferred. The coefficient for the pilot study was .78.

Data Collection

Survey responses were collected according to the principles of the Dillman Tailored Design Method (2007). According to Dillman (2007), "multiple attempts are essential to achieving satisfactory response rates to self-administered surveys regardless of whether administered by e-mail, the web, or postal delivery" (p. 13).

All items of correspondence for this survey, including the pre-letter, first contact with a link to the questionnaire, and subsequent reminder links, were distributed electronically via Qualtrics Survey Software.

The pre-letter e-mail (see Appendix E) was distributed to all producers on August 22, 2011. This first-contact correspondence was signed by a Drovers/CattleNetwork representative to confirm the publication's involvement in and support of the study.

The first researcher/panel contact (see Appendix F), including a link to the Web-based questionnaire, was distributed on August 24, 2011, two days after the pre-letter was

sent. Reminder e-mails including new links to the questionnaire were distributed on August 31, September 7, September 14, and September 21, 2011 (See Appendices G, H, I, & J). The questionnaire was closed on September 18, 2011, five weeks after initial distribution.

Response Rate

Despite implementing the Dillman Tailored Design Method (2007), this study received a low response rate to the Web-based questionnaire. Two participants from the random sample contacted the primary researcher indicating they were not eligible to participate in the survey, resulting in a final working sample size of n=498. Of those producers, 47 responded within the 5-week survey period for a response rate of 9.4%.

Schonlau et al. (2002) stated “As far as response rates are concerned, it appears that when only one response option is given, mail response rates are higher than Web or e-mail response rates” (p. xix). Dillman (2007) also suggested using a mixed-model design to reach those with lower computer usage rates. Thus, this survey may have obtained a higher response rate by implementing a bimodal survey model, including a round of mailed questionnaires.

Although low, the response rate was determined to be acceptable for the purposes of this study. According to Langer (2003), “Recent published research has shown no substantial effect of lower response rates on measurements of opinion” (p.17). This is not to say that nonresponse bias does not occur. However, as stated by Myers and Irani (2011), “lower non response rates do not necessarily indicate nonresponse bias in survey results” (p. 53). In fact those that respond to a survey, even if the numbers are low, are likely to be more representative of the target audience and thus more accurate than

nonrespondents (Miller & Carr, 1997). As Langer (2003) contended, “a higher response rate is not automatically indicative of better data” (p. 18).

Reducing Survey Error

Dillman (2007) discussed four sources of survey error that affect the precision and accuracy of self-administered surveys: sampling error, coverage error, measurement error, and nonresponse error (p. 9-10).

This study was primarily concerned with two sources of error: nonresponse error and coverage error. “Nonresponse error occurs when a significant number of people in the survey sample do not respond to the questionnaire *and* have different characteristics from those who do respond, when those characteristics are important to the study” (Dillman, 2007, p. 10). In their discussion on data quality, Schonlau et al. (2002) stated, “the most important issue in data quality is the extent to which nonrespondents would have responded differently than respondents” (p. 17). To control for nonresponse error in this study, a follow-up phone survey was conducted with approximately 10% of the non-respondents (n=47). Phone calls were made on October 21 and 22, 2011, with a panel of three callers, including the primary researcher. A script developed by the researcher was used to conduct the phone surveys (see Appendix K), and panel members were trained by the primary researcher on survey protocol. Characteristics of respondents and non-respondents were compared yielding no statistical difference between the two groups; this provided confidence that results from the survey are generalizable to the entire population of this study.

Coverage error also merits discussion as it relates to this Web-based survey, as it is “the most widely recognized shortcoming of Internet surveys” (Schonlau et al., 2002,

p. 29). Coverage error can be defined as “the result of not allowing all members of the survey population to have an equal or known chance of being sampled for participation in the survey” (Dillman, 2007, p. 11). As discussed previously in this chapter, the population for this survey included all cattle producers who belonged to Drovers/CattleNetwork in 2011, had a valid e-mail address on account with the publication and had not opted-out of third party contact. Based on these criteria, producers without an active e-mail address or those who had not updated their e-mail address with Drovers/CattleNetwork were excluded from the study, as were producers who had a valid e-mail address but opted out of third party contact. The first of these exclusions, producers without a valid e-mail address, was less of a concern for this particular study. As noted by Schonlau et al. (2002) “A population with less-than-universal access to the Internet can be immaterial for some studies, such as those that focus on closed populations with equivalent access or populations of Internet users” (p. 29). Such was the case with this study. Nonetheless, this particular type of coverage error is noted in the study limitations, as it did exclude a significant number of producers who do not use the Web. The latter of the two exclusions, producers who had a valid e-mail address but opted out of third party contact with Drovers/CattleNetwork, did present a certain level of coverage error that could not be prevented given the scope and design of this study.

Data Analysis

Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS), software version 17.0. Descriptive statistics, defined by Creswell (2007) as procedures used to summarize and describe data, were used in the analysis. Specifically,

frequencies, percentages, measures of central tendency, and cross tabulations were calculated to interpret the data.

CHAPTER IV

FINDINGS

Introduction & Objectives

This chapter focuses on the findings obtained from this study. The results will be discussed as they pertain to each of the following objectives, established in Chapter I:

1. Determine selected personal and professional characteristics (sex, age, education, size and type of cattle operation, role in cattle operation, and access to technology) of U.S. beef producers.
2. Determine U.S. beef producers' preferred source(s) of information.
3. Determine U.S. beef producers' current use of social media.
4. Determine U.S. beef producers' perceptions regarding the credibility of information received via social media tools.
5. Determine how selected personal and professional characteristics (sex, education, and size of cattle operation) of U.S. beef producers relate to their preferred sources of information, use of social media, and perceived credibility of information received via social media tools.

Research Findings

Findings Related to Objective 1

Of the 47 producers who participated in this survey 85.1% were male (n=40) and 14.9% were female (n=7). Respondents ranged in age from 21 to 79 years, with an average age of 53.7 years. Seventeen respondents had completed a bachelor's degree (36.3%), five obtained an associate's degree (10.6%), and sixteen were high school graduates (34%). Nine respondents (19.2%) reported having a post-graduate degree, including four with a master's degree (8.5%), one education specialist (2.1%), two with a professional degree (4.3%), and two doctoral degrees (4.3%).

Nearly all of the producers were owner/operators (n=41, 87.2%) of a commercial cow-calf operation (n=33, 70.2%). More than half (n=24, 51%) reported an average of 100 to 249 head of cattle, while the second most common herd size, 250 to 499 head, represented 21.3% of respondents (n=10). Sixteen respondents (34%) reported having a second job outside of the beef industry; of those 16, three had jobs related to the beef industry and four were involved in other fields related to agriculture. See Table 1 for a summary of data regarding U.S. beef producers' personal and professional characteristics.

Regarding access to technology, every producer in the study had Internet access at their home or cattle operation. Eighteen respondents (38.3%) reported owning a smart phone. Producers' use of smart phone technologies varied; fourteen producers (29.8%) used their phones to send and receive text messages, check e-mail, and access the Internet. A smaller number (n=8, 17%) reported accessing social media tools on their smart phones, and four producers (8.5%) indicated other uses including collecting herd

data, accessing market updates, monitoring conditions of interest, and using GPS technologies.

Table 1
Summary of U.S. beef producers' personal and professional characteristics (n=47)

	<i>F</i>	%	Range	Mean	Mode
Gender					
Male	40	85.1			
Female	7	14.9			
Age			21 – 79	53.7	56, 61
Education					
High School	16	34.0			
Associates	5	10.6			
Bachelor's	17	36.2			
Master's	4	8.5			
Education Specialist	1	2.1			
Professional	2	4.3			
Doctoral	2	4.3			
Size of Operation					
<100	1	2.1			
100 – 249	24	51.1			
250 – 499	10	21.3			
500 – 999	7	14.9			
1000+	5	10.6			
Type of Operation					
Cow – Calf	33	70.2			
Seedstock	4	8.5			
Stocker/backgrounder	4	8.5			
Finisher	3	6.4			
Other	3	6.4			
Role in Operation					
Owner/operator	41	87.2			
Herd Manager	4	8.5			
Herdsman/Ranch					
Hand	1	2.1			

Findings Related to Objective 2

Objective two sought to determine beef producers' preferred sources of information. Survey question one asked respondents to rank five sources of information from their most preferred (1) to their least preferred (5). The five sources were: livestock publications, Extensions specialists, other beef producers, the Internet, and social media (see Table 2).

Table 2
Beef producers' preferred source(s) of information (n=47)

Source	1		2		3		4		5	
	<i>f</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%	<i>f</i>	%
Livestock publications	27	57.4	13	27.7	6	12.8	-	-	1	2.1
Internet	9	19.1	16	34.0	11	23.4	8	17.0	3	6.4
Other producers ^a	5	10.6	11	23.4	11	23.4	11	23.4	9	19.1
Extension specialists	3	6.4	7	14.9	15	31.9	13	27.7	9	19.1
Social media ^b	2	4.3	3	6.4	4	8.5	14	29.8	23	48.9

Note. Mode for each source is in boldface.

^aSource had multiple modes. ^bOne respondent ranked social media as "6."

Livestock publications were ranked first by more than half of respondents (n=27, 57.4%) and had a mode ranking of one. The Internet received a mode ranking of two, while respondents were split on their ranking of other producers, resulting in multiple modes of two, three, and four. Extension specialists had a mode of three, with more than half of producers (n=28, 59.6%) ranking it either third or fourth. Social media, ranked last by 23 producers (48.9%), had a mode of five. All five sources received at least one first-

place ranking; social media was placed first by two producers (4.3%), the Internet was first for nine producers (19.1%), five respondents (10.6%) indicated they preferred receiving information from other producers, and three (6.4%) indicated Extension specialists as their source of choice.

Findings Related to Objective 3

The third objective was aimed at determining producers' current use (or non-use) of social media tools. This objective was multi-faceted in that it sorted respondents into their respective groups, social media users and non-users, and then asked further questions relative to the population subsets. Question two was the *sorter* question. It asked producers to indicate if they currently used any social media tools; if they did, producers were asked to specify how many hours per week they used tools including Facebook, Twitter, LinkedIn, YouTube, and blogs. There was a nearly even split between respondents, with 24 (51.1%) indicating they used social media and 23 (48.9%) indicating they did not use social media.

Social media users.

Of those that indicated some level of social media use, Facebook was the most common tool used (n=16, 34%). The average amount of time spent on Facebook per week was approximately two hours 45 minutes, with a reported range from 15 minutes to 10 hours of use per week. Facebook was followed in use by YouTube (n=8, 17%), blogs (n=7, 14.9%), LinkedIn (n=5, 10.6%), and Twitter (n=3, 6.4%). Five producers (10.6%) indicated they used a social media tool not listed.

Question three in this subset asked producers to indicate, from a list, their reason(s) for using social media. Fifteen of the 24 producers (62.5%) who used social

media indicated doing so to access information regarding beef production, marketing, and herd management strategies, as well as other agricultural information including market updates, crop conditions, and agricultural news. Half of respondents (n=12) indicated they used social media to communicate with other producers, while 66.7% (n=16) said they used social media for purposes not related to the beef or agricultural industries.

Regarding the amount of time dedicated to social media use, responses ranged from several times a day (n=10, 41.7%) to only a few times a month (n=1, 4.2%). A quarter of respondents (n=6) reported accessing social media a few times a week, while 29.2% (n=7) indicated they accessed the tools once per day.

The last question for this subset asked respondents to rate their level of agreement with a statement regarding whether interaction via social media helped them feel more connected to various sources. This question was based on a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

When asked to describe their level of agreement with the statement: “Receiving information from and interacting with friends/individuals via social media helps me feel more connected to those individuals,” more than half of respondents (n=15, 62.5%) agreed while only one (4.2%) disagreed.

For the same statement, replacing “friends/individuals” with “other beef producers,” the number who agreed dropped from 15 (62.5%) for friends/individuals to 13 (54.2%), and the number who reported they were neutral increased from five (20.8%) to 10 (41.7%). No respondents disagreed with this statement.

The last statement, “Receiving information from and interacting with beef industry organizations helps me feel more connected with those organizations,” also

yielded no disagreement from respondents. Ten producers (41.7%) indicated they felt neutral, half (n=12) agreed with the statement, and two producers (8.3%) strongly agreed that interacting through social media helped them feel more connected to beef industry organizations.

All four attitudinal statements had a mode ranking of 4, meaning producers generally agreed that interacting with friends/individuals, other beef producers, and beef industry organizations helped them feel more connected to those entities. Table 3 highlights the responses to this question.

Table 3
Beef producers' level of agreement regarding feeling connected to various sources through social media (n=24)

Source	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Friends/ Individuals	-	-	1	4.2	5	20.8	15	62.5	3	12.5
Other Beef Producers	-	-	-	-	10	41.7	13	54.2	1	4.2
Beef Industry Organizations	-	-	-	-	10	41.7	12	50.0	2	8.3

Note. Mode level of agreement for each source is in boldface.

Social media non-users.

Shifting to respondents who indicated they did not use social media, a similar set of questions was asked to determine reasons for non-use and potential interest in receiving information via social media from various sources. Question three for this subset asked producers to indicate, from a list, their reason(s) for not using social media. Fourteen respondents (60.9%) indicated that they had no interest in using social media tools. Nearly half of respondents (n=11, 47.8%) indicated they did not have time for

social media, and two producers (8.7%) indicated they did not know how, they did not have the tools, or they did not think social media was important. Three producers (13%) indicated *Other* as a reason they did not use social media; all three noted security issues as a concern.

With 14 producers indicating they had no interest in social media, there were nine respondents left in this subset who were asked two additional questions regarding their potential interest in receiving information via social media. Question four in this section was synonymous with question five for social media users, asking producers to rate their level of agreement with a statement regarding their interest in receiving information via social media from various sources based on a five-point Likert-type scale ranging from 1=Strongly Disagree to 5=Strongly Agree (see Table 4).

Table 4
Beef producers' level of agreement regarding interest in interacting with various sources via social media (n=9)

Source	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	<i>f</i>	%	<i>F</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Friends/ Individuals	2	22.2	2	22.2	4	44.4	1	11.1	-	-
Other Beef Producers	2	22.2	2	22.2	2	22.2	3	33.3	-	-
Beef Industry Organizations	2	22.2	2	22.2	2	22.2	3	33.3	-	-

Note. Mode level of agreement for each source is in boldface.

Regarding the statement “I would be interested receiving information from and interacting with friends/individuals via social media tools,” four of the nine producers (44.4%) were neutral, while one agreed (11.1%), two disagreed (2.2%), and two strongly disagreed (2.2%). The mode for this attitudinal scale was 3 (neutral).

For the same statement, replacing “friends/individuals” with “beef producers,” respondents indicated a higher level of interest (Mo=4, agree). One-third of producers (n=3, 33.3%) agreed with this statement, while two each (2.2%) indicated they strongly disagreed, disagreed, or were neutral. Results for interest in receiving information from beef industry organizations via social media were identical to those reported for other beef producers.

The final question for this subset of nine respondents asked them to indicate, from a list, potential information they would be interested in receiving via social media tools. This question was synonymous with question three for social media users.

Five of the nine respondents (55.6%) indicated they would be interested in using social media to access information regarding beef production, marketing, and herd management strategies, while a slightly higher number (n=6, 66.7%) said they would be interested in accessing other agricultural information such as market updates, crop conditions, and other agriculturally related news. Only two respondents (2.2%) said they would want to communicate with other producers, and no one expressed an interest in using social media for purposes not related to the beef or agricultural industries.

Findings Related to Objective 4

All respondents, regardless of whether they indicated they did or did not use social media, were asked two questions regarding credibility of information shared via social media tools. Question six used a five-point Likert-type scale to determine producers’ perceived credibility of information received from various sources (1=Never Credible, 2=Rarely Credible, 3=Neutral, 4=Usually Credible, 5=Always Credible). Table 5 provides an overview of responses to this question.

Table 5

Beef producers' perceived credibility of information received via social media, based on source (n=47)

Source	Never Credible		Rarely Credible		Neutral		Usually Credible		Always Credible	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>F</i>	%
Friends/ Individuals ^a	-	-	3	6.4	21	44.7	21	44.7	-	-
Other Beef Producers	-	-	1	2.1	17	36.2	25	53.2	-	-
Beef Industry Organizations	-	-	1	2.1	11	23.4	27	57.4	5	10.6

Note. Mode for each source is in boldface.

^aSource had multiple modes.

Regarding the statement “Information received from friends/individuals via social media is...” 44.7% (n=21) of respondents said “usually credible” and the same number indicated they were neutral. Only three respondents (6.4%) said information from friends/individuals was rarely credible.

The same statement was made regarding the credibility of information received from other beef producers and beef industry organizations through social media tools. Over half of respondents (n=25, 53.2%) indicated that information received from other beef producers via social media was “usually credible,” and 57.4% (n=27) said the same of information from beef industry organizations. Five producers (10.6%) said information from beef industry organizations was “always credible,” and only one producer (2.1%) responded that both sources were “rarely credible.” Remaining respondents were neutral to information from these sources.

Question seven was a ranking-type question, similar to the first question of the survey regarding producers' preferred sources of information. Respondents were asked to

rank the same five sources (livestock publications, Extension specialists, other producers, the Internet, and social media) based on source credibility from most credible (1) to least credible (5). As shown in Table 6, responses revealed that a producer's preferred source of information is not always the source they view as most credible.

Table 6
Beef producers' ranking of source credibility for information shared via social media (n=47)

Source	1		2		3		4		5	
	<i>f</i>	%	<i>F</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Livestock publications	21	44.7	14	29.8	10	21.3	2	4.3	-	-
Extension specialists	17	36.2	14	29.8	10	21.3	5	10.6	1	2.1
Other producers ^a	6	12.8	12	25.5	12	25.5	12	25.5	5	10.6
Internet	1	2.1	10	21.3	14	29.8	16	34.0	6	12.8
Social media ^b	1	2.1	1	2.1	3	6.4	12	25.5	29	61.7

Note. Mode for each source is in boldface.

^aSource had multiple modes.

Livestock publications were again ranked first by the majority of respondents (n=21, 44.7%) with a mode ranking of one. The Internet, which received a mode ranking of two as a preferred source of information, dropped to a mode of four and was ranked first by only one producer (2.1%). Extension specialists improved from a mode of three as a preferred source, to a mode of one for credibility. Respondents were split on their feelings toward the credibility of other producers, with 12 producers each (25.5%) indicating a ranking of two, three, or four. Social media was ranked last by 29 producers (61.7%), again placing it at the bottom with a mode of five.

Findings Related to Objective 5

Objective five was an analysis of how selected personal and professional characteristics of U.S. beef producers, as determined by objective one, related to producers' preferred sources of information, use of social media, and perceived credibility of information received via social media tools.

Findings based on sex.

As stated earlier in this chapter, more than 85% (n=40) of respondents in this study were male. Although cross-tabulations were calculated to compare responses of male and female respondents, it is important to keep in mind the limitations inherent to generalizing these responses due to a low number of female respondents (n=7, 14.9%).

When comparing preferred sources of information, both male and female respondents placed livestock publications first (Mo=1) and social media last (Mo=5). Male respondents ranked Extension specialists (Mo=3) and other producers (Mo=2) higher than females, who ranked the two fourth and third, respectively. The Internet received higher ratings from the women (Mo=1) than the men (Mo=2). It is notable that other producers did not receive any first or second place rankings from female respondents. Table 7 summarizes the modes for each source of information based on male and female responses.

Table 7
Preferred source(s) of information based on sex (n=47)

Source	Male Mo (n=40)	Female Mo (n=7)
Livestock publications	1	1
Extension specialists	3	4
Other producers	2	3
Internet	2	1
Social media	5	5

Male respondents were split almost evenly on social media use, with 19 (47.5%) users and 21 (52.5%) non-users. Five of the seven female respondents (71.4%) reported using social media. Facebook was the most used social media tool, capturing 59.9% (n=11) of the male and 100% (n=5) of the female social media audience. More than half of male respondents reported using blogs (n=6, 54.5%) and YouTube (n=7, 63.6%), while just under half used LinkedIn (n=5, 45.5%). Table 8 summarizes the use of social media tools based on sex.

Table 8
Social media tools used based on sex (n=24)

Social media tool	Male (n=19)		Female (n=5)	
	f	%	f	%
Facebook	11	57.9	5	100
Twitter	3	27.3	-	-
LinkedIn	5	45.5	-	-
Blogs	6	54.5	1	20.0
YouTube	7	63.6	1	20.0
Other	4	36.4	1	20.0

Male respondents indicated they used social media to: access information related to the beef industry (n=13, 68.4%); access other agriculturally related information (n=12, 63.2%); and communicate with other producers (n=10, 52.6%). While 100% (n=5) of women reported using social media tools for reasons not related to the beef or agricultural industries, only 57.9% (n=11) of men said the same (see Table 9).

Table 9
Uses of social media tools based on sex (n=24)

	Male (n=19)		Female (n=5)	
	<i>f</i>	%	<i>f</i>	%
Access information related to beef production, marketing, & herd management	13	68.4	2	40.0
Access other agricultural information such as market updates, crop conditions, & agricultural news	12	63.2	3	60.0
Communicate with other producers	10	52.6	2	40.0
Purposes not related to the beef and/or agricultural industries	11	57.9	5	100.0
Other	-	-	-	-

Four out of the five women (80%) using social media reported doing so several times per day. Among male respondents, six (31.6%) used social media several times per day, six used it once a day, and six only a few times a week. One producer reported he only accessed social media a few times a month (see Table 10).

Table 10
Amount of use of social media tools based on sex (n=24)

	Male (n=19)		Female (n=5)	
	<i>F</i>	%	<i>f</i>	%
Several times/day	6	31.6	4	80.0
Once/day	6	31.6	1	20.0
A few times/week	6	31.6	-	-
A few times/month	1	5.3	-	-

There were no differences between men and women regarding the level of connectedness felt toward friends/individuals, other beef producers, or beef industry organizations when communicating with these sources via social media. Both groups agreed (Mo=4) that interacting with each source helped them feel more connected.

Of the 21 male producers (53.5%) who did not use social media, more than half reported they were not interested (n=13, 61.9%) and/or they did not have time (n=11, 52.9%). Two each (9.5%) indicated: they did not know how, they did not have the tools, or they did not think it was important. Two of the seven females (28.6%) did not use social media; one said she was not interested, and the other indicated *Other*, stating that social media is too public.

Both users and non-users were asked to rank the credibility of information shared by a variety of sources via social media. Both male and female respondents indicated that other beef producers as well as beef industry organizations are “usually credible” (Mo=4) sources of information. Women also indicated that friends/individuals are usually credible (Mo=4), while men ranked friends/individuals “neutral” (Mo=3).

Ranking sources based on credibility from 1 (most credible) to 5 (least credible), male and female respondents were generally the same except for one source: other producers. Men ranked other producers much higher (Mo=2) than did women (Mo=4) as a credible source of information. Also important to note, the Internet dropped in ranking from a mode of two for males and one for females as a preferred source to a mode of four for both males and females based on source credibility. Extension moved in the opposite direction, from a mode of three for men and four for women as a preferred source, to a mode of two for men and one for women regarding source credibility (see Table 11).

Table 11
Mode for preferred source versus mode for level of credibility of the Internet and Extension specialists based on sex

	Internet		Extension Specialists	
	Preferred Source (Mo)	Credibility (Mo)	Preferred Source (Mo)	Credibility (Mo)
Males	2	4	3	2
Females	1	4	4	1

Findings based on size of operation.

To analyze the effect of operation size, respondents were divided into two subsets: smaller operations of 249 head of cattle or less (n=25, 53.2%) and larger operations of 250 head of cattle or more (n=22, 46.8%).

For preferred sources of information, both operation sizes ranked livestock publications above all other sources (Mo=1). More than half of producers in each group placed livestock publications first, and for respondents owning 249 head or less, livestock publications were not ranked below a three.

The two groups also had similar rankings for the Internet (Mo=2) and for social media (Mo=5). The ranking of Extension specialists differed between the two groups, with smaller producers rating Extension higher (Mo=3) than larger producers (Mo=4). Respondents with less than 250 head also ranked other producers as a source of information higher (Mo=2) than respondents with 250 head or more (Mo=3). Table 12 summarizes these findings.

Regarding use of social media, both operation sizes were split almost 50/50 between users and non-users of social media. However, there were some differences in the information accessed and time dedicated to social media between the two groups.

Table 12
Preferred source(s) of information based on size of operation (n=47)

Source	249 < Mo (n=25)	250 > Mo (n=22)
Livestock publications	1	1
Extension specialists	3	4
Other producers	2	3
Internet	2	2
Social media	5	5

Twelve producers of each operation subset indicated using social media, representing 48% of smaller producers and 54.5% of larger producers. See Table 13 for results of social media tools used based on size of operation.

Table 13
Social media tools used based on size of operation (n=24)

Social media tool	249 < (n=12)		250 > (n=12)	
	<i>F</i>	%	<i>f</i>	%
Facebook	6	50.0	10	83.3
Twitter	2	16.7	1	8.3
LinkedIn	4	33.3	1	8.3
Blogs	4	33.3	3	25.0
YouTube	3	25.0	5	41.7
Other	3	25.0	2	16.7

Smaller producers indicated a greater level of access to information regarding beef production, marketing, and herd management strategies with 75% (n=9) of smaller producers and 50% (n=6) of larger producers (n=6) accessing this type of information. An even larger number of smaller producers (n=11, 91.7%) indicated receiving other agricultural information from social media; only four (33.3%) larger producers accessed other agricultural information. Conversely, 83.3% (n=10) of larger producers indicated a greater use of social media tools for purposes not related to the beef and/or agricultural

industries; half of smaller producers (n=6) used social media in ways unrelated to agriculture and the beef industry. See Table 14 for detailed results.

Table 14
Uses of social media tools based on size of operation (n=24)

	249 < (n=12)		250 > (n=12)	
	<i>F</i>	%	<i>f</i>	%
Access information related to beef production, marketing, & herd management	9	75.0	6	50.0
Access other agricultural information such as market updates, crop conditions, & agricultural news	11	91.7	4	33.3
Communicate with other producers	6	50.0	6	50.0
Purposes not related to the beef and/or agricultural industries	6	50.0	10	83.3
Other	-	-	-	-

Smaller producers indicated using social media on a more frequent basis than larger producers; 50% (n=6) of respondents owning less than 250 head of cattle said they accessed social media several times a day, while only four producers (33.3%) with 250 head or more indicated the same. Of the larger producers, 41.7% (n=5) indicated accessing social media only a few times a week (see Table 15).

Table 15

Amount of use of social media tools based on size of operation (n=24)

	249 < (n=12)		250 > (n=12)	
	<i>f</i>	%	<i>F</i>	%
Several times/day	6	50.0	4	33.3
Once/day	4	33.3	3	25.0
A few times/week	1	8.3	5	41.7
A few times/month	1	8.3	-	-

On the attitudinal scale regarding feelings of connectedness created by social media interaction, producers with less than 250 head of cattle had a mode of four (agree) for friends/individuals, but were neutral (Mo=3) for feelings of being connected to other beef producers or beef industry organizations through social media. Respondents with 250 head or more had a mode of four (agree) for all three source categories; 83% (n=10) agreed to feeling connected to friends/individuals, while 66.7% (n=8) agreed that social media helped them feel more connected to both other beef producers and beef industry organizations.

Respondents who did not use social media numbered 13 (52%) for smaller operations and 10 (45.5%) for larger operations. Regardless of size of operation, the most common reasons for not using social media were “I don’t have time...” and “I am not interested...” However, three respondents (30%) with greater than 250 cattle indicated *Other* as a reason for not using social media; all three noted security concerns.

For the Likert-type question regarding the credibility of information received from various sources via social media, both groups indicated that other beef producers and beef industry organizations are “usually credible” (Mo=4). Producers from larger operations also indicated that friends/individuals are usually credible (Mo=4), while producers from smaller operations were neutral toward this source (Mo=3).

Livestock publications were ranked first for credibility (Mo=1) by both small and large producers, with social media ranked least credible (Mo=5). As with the male and female cross-tab data, Extension specialists and the Internet switched positions between preferred source of information and credibility of source (see Table 16).

Table 16
Mode for preferred source versus mode for level of credibility of the Internet and Extension specialists based on size of operation

	Internet		Extension Specialists	
	Preferred Source (Mo)	Credibility (Mo)	Preferred Source (Mo)	Credibility (Mo)
249 < head ^a	2	3	3	1, 2
250 > head	2	4	4	1

^aSource had multiple modes.

Findings based on level of education.

Respondents were also divided into two educational subsets to analyze the effect of education on use and perceptions of social media. Those with a bachelor’s degree or higher (n=26, 55.3%) represented one group, while those with a high school education or associate’s degree (n=21, 44.7%) represented the other.

These two groups of respondents ranked the five sources of preferred information nearly identically, with only one exception (see Table 17). Respondents with a bachelor’s or greater rated other producers lower (Mo=4) as a source of information than those who obtained less a bachelor’s degree (Mo=2).

Table 17
Preferred source(s) of information based on level of education (n=47)

Source	Less than B.S. Mo (n=21)	B.S. or greater Mo (n=26)
Livestock publications	1	1
Extension specialists	3	3
Other producers	2	4
Internet	2	2
Social media	5	5

There were larger disparities between these two subsets in the number of respondents who used social media and what specific tools they used. While only one third of respondents (n=7) with less than a bachelor's indicated using social media, 17 (65.4%) of the more highly-educated producers reported they were social media users. Of the seven producers who completed high school or an associate's degree, 3 (42.9%) used Facebook for just over two hours per week on average. Thirteen (76.5%) of those with a bachelor's or higher degree reported using Facebook for an average of almost three hours a week. Those who completed a higher education also reported using a variety of other social networking tools, including Twitter (n=3, 17.6%); LinkedIn (n=5, 29.4%); blogs (n=7, 41.2%); and YouTube (n=8, 47.1%). Respondents with less than a bachelor's degree did not use any of the other social media tools, but four (57.1%) reported using e-mail, which they classified as *Other* social media (see Table 18).

As shown in Table 19, more than half of producers for each educational subset indicated using social media to access information related to the beef industry. Four (57%) of those with less than a bachelor's and 11 (64.7%) of those with a bachelor's or greater accessed social media for this purpose. Other agriculturally related information

was accessed by five (71.4%) of those with a high school education or associate's degree and 10 (58.8%) of those with a bachelor's or higher degree.

Table 18
Social media tools used based on level of education (n=24)

Social media tool	Less than B.S. (n=7)		B.S. or greater (n=17)	
	<i>f</i>	%	<i>F</i>	%
Facebook	3	42.9	13	76.5
Twitter	-	-	3	17.6
LinkedIn	-	-	5	29.4
Blogs	-	-	7	41.2
YouTube	-	-	8	47.1
Other	4	57.1	1	5.9

Table 19
Uses of social media tools based on level of education (n=24)

	Less than B.S. (n=7)		B.S. or greater (n=17)	
	<i>F</i>	%	<i>f</i>	%
Access information related to beef production, marketing, & herd management	4	57.1	11	64.7
Access other agricultural information such as market updates, crop conditions, & agricultural news	5	71.4	10	58.8
Communicate with other producers	1	14.3	11	64.7
Purposes not related to the beef and/or agricultural industries	4	57.1	12	70.6
Other	-	-	-	-

Only one producer with less than a bachelor’s degree reported communicating with other producers via social media, while 11(64.7%) of those with a higher level college education indicated they used social media communicate with fellow producers. More than half of the respondents for each group said they accessed social media at least once a day or more (Table 20).

Table 20
Amount of use of social media tools based on level of education (n=24)

	Less than B.S. (n=7)		B.S. or greater (n=17)	
	<i>F</i>	%	<i>f</i>	%
Several times/day	2	28.6	8	47.1
Once/day	4	57.1	3	17.6
A few times/week	-	-	6	35.3
A few times/month	1	14.3	-	-

Producers with a bachelor’s degree or higher reported a higher level of connectedness (Mo=4, agree) with friends/individuals, other producers, and beef industry organizations, than those with less than a bachelor’s, who indicated they were neutral (Mo=3) toward all three sources. Both groups reported that they believe information from the above three sources is “usually credible,” with the exception of those with less than a bachelor’s indicating they were neutral toward the credibility of information shared by friends/individuals via social media.

In ranking source credibility, both educational subsets again reported the same mode ranking for livestock publications (Mo=1), Extension specialists (Mo=1), and social media (Mo=5). Those with a high school education or associate’s degree ranked the credibility of other producers higher (Mo=2) than those with a bachelor’s degree or

higher (Mo=4). The two groups also differed on their credibility ranking of the Internet; respondents with less than a bachelor's ranked the Internet lower (Mo=4) than those with a bachelor's or higher (Mo=3).

Table 21
Mode for preferred source versus mode for level of credibility of the Internet and Extension specialists based level of education

	Internet		Extension Specialists	
	Preferred Source (Mo)	Credibility (Mo)	Preferred Source (Mo)	Credibility (Mo)
Less than bachelor degree	2	4	3	1
Bachelor degree or above	2	3	3	1

Two-thirds of respondents (n=14) with less than a bachelor's reported they did not use social media, while only nine (34.6%) of those with a higher-level degree said the same. For both subsets of social media non-users, more than two-thirds indicated they did not have time for social media. Eleven (78.6%) of those who achieved less than a bachelor's degree reported no interest in using social media. That number was only 33.3% (n=3) for those with at least a bachelor's. Of the six remaining producers with a higher-degree who did not use social media but reported some level of interest, 50% (n=3) said they would be interested in receiving information regarding beef production and herd management, while 83.3% (n=5) said they would like to receive other agricultural information.

CHAPTER V

CONCLUSIONS, RECOMMENDATIONS, & IMPLICATIONS

Introduction

This chapter begins with a review of the problem statement, purpose, and objectives that guided this research. Thereafter, conclusions, recommendations, and implications are discussed based on the findings of this study as they relate to the five objectives. The last section is reserved for further discussion of the research.

Statement of the Problem

“As the relative value of information increases, sources of that information are changing as well” (Boehlje & King, 1998, p. 22). Communication technologies, such as the Internet, have universally changed the way information is shared; the agricultural industry is no exception. In 1998 Boehlje and King predicted that Web-based communication systems, then only available to producers in their homes and offices, would “soon expand to their cars, trucks, tractors and combines” (p. 27). Just more than a decade later, this vision has become a reality. Vehicles, as well as agricultural machinery, come with options including global positioning systems (GPS), satellite radio, and other technologies that were not even thought of by producers of previous generations.

With this increased competition in the information marketplace, understanding the informational needs of agricultural producers has become critical (Diekmann & Batte, 2009).

Recently, social media has emerged as a popular and accepted platform for information sharing. According to Hoffman (2009) “Social media is sweeping the nation as well as the agricultural community” (para. 2). Social media tools present the opportunity for positive social engagement, potentially bridging the gap between producers and consumers (Hoffman, 2009). The growing prevalence of smart phones makes these tools accessible to producers 24 hours a day. These attributes of social media provide the potential for a constructive communication interface both within the agricultural industry and between agriculture and the general public. Not participating in social media can lead to missed opportunities (Lohr, 2011). For these reasons, there is a need to explore the current use and perceived credibility of social media as a communications tool within the agricultural industry, and specifically for this study, the U.S. beef industry.

Purpose

The purpose of this study was to determine U.S. beef producers’ current use and perceived credibility of social media as a communications tool.

Objectives

The objectives of this study were as follows:

1. Determine selected personal and professional characteristics (sex, age, education, size and type of cattle operation, role in cattle operation, and access to technology) of U.S. beef producers.

2. Determine U.S. beef producers' preferred source(s) of information.
3. Determine U.S. beef producers' current use of social media.
4. Determine U.S. beef producers' perceptions regarding the credibility of information received via social media tools.
5. Determine how selected personal and professional characteristics (sex, education, and size of cattle operation) of U.S. beef producers relate to their preferred sources of information, use of social media, and perceived credibility of information received via social media tools.

Conclusions, Recommendations, & Implications

Objective 1

The typical beef producer for the target population is 53.7 years old, male, and an owner/operator of a commercial cow-calf herd. The typical herd size is between 100-249 head. Most producers have at least a high school education, while many obtain a bachelor's degree. Although off-farm employment is not the norm, those who do have a second job tend to work within the agricultural or beef industry.

These producers have Internet access at their home or operation, and several also own a smart phone, which they used to check e-mail and access the Internet; a small number of producers use their phones to access social media tools.

The personal and professional characteristics of beef producers in this study are similar to the aggregate demographics of the 91,000 Drovers/CattleNetwork subscribers who are 53 years of age with at least a high school education. According to the 2007 U.S. Census of Agriculture, the average age of producers in the United States is increasing each year. In fact, "The number of operators 75 years and older grew by 20 percent from

2002, while the number of operators under 25 years of age decreased 30 percent” (U.S. Census of Agriculture, 2007). This aging demographic is also present in the beef industry, and likely has an effect on how producers prefer to receive information.

Objective 2

Livestock publications are the preferred source of information among the target population. This supports previous studies which have found livestock publications, farm magazines, and other print media to be an important source of information for agricultural producers (Brashear et al., 2000; Diekmann & Batte, 2009; Obahayujie & Hillison, 1988; Radhakrishna et al., 2003; Vergot et al. 2005).

The Internet is also a preferred source of information for beef producers. This is contradictory to past findings (Brashear et al., 2000; Diekmann & Batte, 2009; Radhakrishna et al., 2003). Upon examining information search strategies of Ohio farmers, Diekmann and Batte (2009) found farmers were “significantly less likely to use electronic media compared to traditional media” (para. 13). The Internet was also one of the least common pathways used for finding information regarding new industry technologies among Illinois swine producers (Brashear et al., 2000).

Generally, beef producers in the target population do not regard Extension specialists as a preferred source of information. There is some discrepancy in the literature regarding producers’ attitudes toward Extension specialists. In a study by Vergot et al. (2005), Florida cattlemen ranked Extension as a highly valued source of information. Ortmann et al. (1993), however, found that U.S. agricultural producers ranked Extension and university specialists significantly lower than other sources of information regarding the usefulness of information for production, marketing, and

financial decisions. According to Boehlje and King (1998), although Extension and the Land Grant system provide the benefits of objectivity and accuracy of information, “these attributes alone may not counter the relative value of convenience and ease” (p. 26) provided by other information sources.

In this context, it is unclear if the producers in this study were rating Extension specialists as a *source* of information or a *channel* of information. A potential weakness of the study could be linked to not having or providing clarity between the two terms. According to Vergot et al. (2005), “A source is an individual or institution that originates a message,” (para. 3) while “A channel is the means by which a message gets from the source to the receiver” (para. 3). Considering these definitions, of the five sources identified in this study, three (livestock publications, the Internet, and social media) are actually *channels* through which information is shared from some originating source. This is an important distinction, especially considering the implications for Extension specialists. It could be that while producers do not prefer traditional Extension information delivery methods, such as on-farm demonstrations or visits, they do prefer Extension as a *source* of information when that information is shared via different *channels*, such as newsletters, magazines, or electronic mediums. As such, it is recommended that future research identify and make clear the distinction between the source of information and the channel through which that information is shared.

Social media is notably producers’ least preferred source of information. It could be that as a relatively new communication technology in the industry, social media is still in the early adoption phases. As noted by Rogers (2003), “Getting a new idea adopted, even when it has obvious advantages, is difficult” (p. 1). It is also possible that the beef

producers in the target population are on the lesser end of innovativeness and fall into the laggards category, as shown in Figure 5 (see Chapter II). If this is the case, replicating this study in the future may show a greater level of adoption of social media tools among U.S. beef producers. If social media continues to gain acceptance as a platform for information sharing, future research in this area will become increasingly important. A similar study in three, five, or even ten years should be considered.

Although livestock publications are producers' clear preference for receiving information, this does not mean the implementation of new media, such as social media, should be abandoned. As pointed out by Flor (2002), there is tremendous potential for the use of information and communication technologies in the agricultural sector.

So what should agricultural communicators do? One possibility would be promoting the use of social media tools, such as an organizational blog or Twitter account, through print publications. If producers currently rely on print media for information, and they see through that medium it is possible to get immediate access to similar content via social media tools, these tools may gain acceptance. At the very least, it would give producers exposure to the technology and move them into the knowledge stage of the innovation-decision process (Rogers, 2003).

Objective 3

Social media users.

Based on the findings of this study, about fifty percent of the target population access social media; Facebook is the most common tool used among producers. Many of those who use social media tools do so to access information about the beef and agricultural industries. This is significant as these producers also report developing

feelings of connectedness to those they network with via social media, including other producers and beef industry organizations. This feeling of connectivity extends beyond the agricultural community. According to a poll by Harris Interactive (2010), almost nine out of ten Americans who are online participate in social media; of those, more than half indicated they feel more connected to people through online communication technologies.

The producers who currently use social media have likely progressed through the implementation and confirmation stages of the innovation-decision process; they are in the early majority of agricultural producers in the adoption of social media. One of the attributes that effects rate of adoption of an innovation is observability (Rogers, 2003). Therefore, if the later adopters and laggards have an opportunity to observe other beef producers successfully using social media, they might also move toward adopting the communication technology. Beef industry organizations and agricultural communicators could augment this process by facilitating learning opportunities for those who have not yet adopted communication technologies.

It might be interesting, in future research, to examine further why producers choose to use certain social media tools over others. For instance, why did producers in the target population use Facebook more than Twitter or blogs? Over time, will the tools preferred change or evolve? This is an area of research that could be explored with a known population of producers who are involved in social networking.

Social media non-users.

It is imperative to consider those producers who do not currently use social media. Lack of time and overall interest seem to be the two factors preventing social media

adoption among the target population. Time is not a new barrier to the adoption of communication technologies among the agricultural community. Smith et al. (2004) noted that while the direct costs of Internet use are low, the time costs involved in learning a new technology may prevent farmers from effective use and adoption. Iddings and Apps (1990) also discussed the challenge of time, noting it significantly reduces the use of computers among farmers. “Cows must be milked, the fields cultivated, rations mixed, and hay put up...the time required [for learning] is substantial” (para. 9).

Security is also an issue of concern for some producers. As discussed in Chapter II, uncertainty can be a barrier to the adoption of any new technology. However, it may be possible to reduce uncertainty through some of the attributes of innovation adoption, such as trialability and observability (Rogers, 2003). A 2011 poll by Harris Interactive indicated that a majority of social media users believe negative experiences can be prevented through the use of privacy settings. A greater level of understanding of the security measures that can be taken might help the rate of adoption of social media among beef producers.

Very few producers consider social media to be unimportant. This is a positive indicator for agricultural communicators and organizations trying to reach beef producers via social media. Even those producers who are not currently using the communication technology recognize its potential and/or realized impacts on the industry.

Objective 4

Producers in the target population generally believe that information shared via social media by other producers and beef industry organizations is credible. Although this is encouraging, social media is still viewed as the least credible among various

information sources. It falls behind livestock publications, Extension specialists, other producers, and the Internet.

Results also indicated that while producers do not prefer Extension as a source of information, they do view it as a credible source. This supports Vergot et al. (2005), who found that despite high ratings overall as a source of information, very few Florida beef producers actually used their Extension agents. Conversely, although the Internet is highly preferred as a source, producers do not seem to have much trust in the information they access through electronic mediums. This dynamic was also discovered by Ashlock (2006).

This is an area rich with potential for future research in agricultural communications. Why do producers prefer to use a source of information they do not trust? Could it be the convenience and ease of access the Internet provides that other information sources and channels do not? Why would producers spend time seeking out information on the Internet if they are not confident it will be accurate or true?

Furthermore, if Extension specialists are so highly trusted by the agricultural community, why do producers not rely on them as a source of information? This again could be in part due to a lack of clarity between a *source* of information and a *channel* used in information sharing. Boehlje and King (1998) suggested that audience satisfaction is increasingly driven by immediate access, and Extension has not been able to compete with the accessibility of other information sharing tools. However, some Extension professionals have already recognized this shift toward online information sharing and are working toward implementing communication technologies (Langcuster, 2010). Rather than seen as the downfall of Extension services, this shift toward a virtual

knowledge platform should be treated as an opportunity for a traditionally “hands on” field to deliver more information to a greater number of producers across a larger geographical area in an expedited, efficient manner. As indicated by Laughlin and Schmidt (1995), to be successful Extension professionals must focus on matching the needs of their clientele with the most appropriate delivery methods. “Extension educators should willingly progress by adopting efficient technologies, but they should not abandon more traditional methods until it is warranted by lack of demand” (Radhakrishna et al., 2003, para. 25).

Objective 5

The literature suggests that there are a number of demographic characteristics that influence the use of information technologies among agricultural producers (Diekmann & Batte, 2009; Smith et al., 2004). For the purposes of this study, we compared sex, size of operation, and level of education to producers’ preferred source(s) of information, use of social media, and perceived credibility of information received via social media tools.

Producer sex.

When comparing male and female respondents, it was concluded that male producers have a more positive opinion of Extension specialists and other producers, both as a preferred source and regarding source credibility. Female producers are more partial to the Internet. Likewise, women tend to use social media more than men, and they use it more frequently, although for purposes not related to the agricultural industry. This could point to the fact that if male producers choose to participate in social networking, they are more likely to do so for reasons related to the beef and agricultural industries.

Given these findings, efforts to gain a larger female audience may be easier as women are more inclined to be involved in social networking. However, the male audience may utilize the resources provided via social media for purposes directly related to the industry, thus having a larger impact on overall efforts of agricultural communicators and industry organizations.

It would be interesting to look further into the reasoning behind female producers' low rankings of other producers, both as a source of information and concerning their level of credibility. Is there some level of discrimination within the beef industry that motivates these perceptions, or do women just prefer less interpersonal interaction than do men in the work environment? The latter of these two inquiries is counterintuitive, however, this could be a possibility for females in a male-dominated industry.

Size of operation.

Smith et al. (2004) found farm size to be a significant determinant of computer and Internet usage patterns among producers. This is in line with Rogers (2003), who noted that individuals with larger-sized units, including agricultural operations, tend to possess a greater level of innovativeness and thus fall earlier in the innovation adoption curve. This study also revealed differences between smaller and larger beef producers regarding their ranking of information sources, uses of social media, and feelings of connectedness created through social media interaction.

Analogous to the aggregate results of this study, both larger and smaller producers prefer livestock publications as their primary source of information. This is similar to the findings of Brashear et al. (2000), who found that both small and large swine producers

preferred to learn about new technologies through popular industry publications.

Producers from all operation sizes also favor the Internet more than other sources, which is contradictory to previous studies (Brashear et al., 2000; Radhakrishna et al., 2003). In fact, Diekmann and Batte (2009) found farmers were “significantly less likely to use electronic media compared to traditional media” (para. 13) in searching for information.

Smaller producers access information regarding beef production, marketing, and herd management strategies, as well as other agricultural information, more than larger producers. Larger producers do not access social media as frequently as smaller producers, and they are more likely than their counterparts to use social media for purposes not related to the agricultural industry.

Interestingly, although smaller producers have a higher level of social media involvement, they feel neutral regarding connectedness with those they interact with using social media tools. Larger producers, who are less active in social networking, feel more connected to friends/individuals, other producers, and beef industry organizations with whom they interact with via social media.

Why would a lower level of activity correlate with greater feelings of connectivity? Are there other attributes at play when considering communication preferences of larger and smaller operations? As with male and female producers, although it may be easier to expand a network with one segment of the population, overall impact may be greater with another, harder to access demographic.

Level of education.

According to Smith et al. (2004), education has a positive effect on the adoption rate of newer technologies. This postulation was supported by the findings of this study,

which found that producers with a bachelor's degree or above use a larger number of social media tools for a greater amount of time than producers with less than a bachelor's degree. Producers with a bachelor's degree or greater also reported feeling more connected to friends/individuals, other producers, and beef industry organizations through social media interaction.

More highly educated producers spend more time communicating with other producers via social media tools than do their counterparts. This is made more interesting by the fact that those who did not achieve a bachelor's degree rate other producers higher both as a preferred source of information and for source credibility.

How does this affect the way agricultural communicators and industry organizations approach these two groups of producers? Or should they be approached differently at all? Because producers with a lesser education are more likely to seek information and guidance from their peers, the observability attribute of innovation adoption may aid in the dissemination of communication innovations such as social media through this segment of the population.

Additional Discussion

As noted by Smith et al. (2004) "factors like age and formal education become less relevant for technology adoption as farmers move up the learning curve" (p. 24). Just as the learning curve for the Internet lagged that of computers, the learning curve for social media lags that of the Internet. As such, the benefits of social media as they relate to the agricultural industry may have not yet been realized by producers. As more producers move through the innovation-decision process and along the adoption curve, social media presence may continue to grow within the agricultural industry.

This study implicates several areas for potential future research, many of which have already been mentioned. Another interesting aspect to consider in the realm of communication technologies and the impact of social media would be the use and perceptions of social media tools within other target populations, such as a more general population of agricultural producers, agricultural organizations, and even consumers. This study is just a starting point, as advancements in communication innovations will continue to affect the way information is shared.

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APPENDICES

APPENDIX A

Approval of Institutional Review Board

Oklahoma State University Institutional Review Board

Date: Friday, July 15, 2011
IRB Application No: AG1139
Proposal Title: Current Use & Perceptions of Social Media as a Communications Tool Among U.S. Beef Producers

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 7/14/2012

Principal Investigator(s):

Jenny L. Gillespie 3398 E. 8th Ave. Stillwater, OK 74074	Dwayne Cartmell 448 Ag Stillwater, OK 74078
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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Sheila Kennison, Chair
Institutional Review Board

APPENDIX B

Survey Instrument

PARTICIPANT INFORMATION

Dear Drivers/CattleNetwork Subscriber,

Thank you for accessing this questionnaire! Your time and input toward this research are greatly appreciated.

Information is one of agriculture's most valuable resources, and advancements in technology are continually changing the way information is disseminated from source to user. Social media is a growing platform for communicating on a real-time basis. The main purpose of this research is to determine U.S. beef producers' current use of social media tools and perceptions of those producers regarding the credibility of information received and shared via social media. Your responses are crucial in helping agricultural communicators and industry professionals understand your communication preferences so they can better serve you by developing communications strategies that fit your needs.

This questionnaire will take approximately 10-15 minutes to complete. You are of a limited number of U.S. beef producers selected to participate in this study, so your input is greatly valued. The risks associated with this research are no greater than those ordinarily encountered in daily life. Please answer questions according to YOUR views and opinions. If you are not able to access the questionnaire, please e-mail me at gillespie.agcmresearch11@gmail.com.

Please remember, your participation in this research is voluntary. You may choose to withdraw your participation in this study at any time by closing out of the questionnaire. Your responses will be identified with your e-mail address, but careful steps will be taken to ensure complete confidentiality. Data will be collected through the Qualtrics Survey Software, then transferred and stored in a password-protected computer for one year, at which time the data will be discarded. Participants who complete the questionnaire will be entered to win a box of premium steaks, which will be awarded within a month of survey completion.

By clicking the "next" button below, you are giving your consent to participate in this study. As this is time sensitive research, your prompt response is greatly appreciated.

Thank you again for taking the time to complete this questionnaire. **If you have any questions regarding the content of the questionnaire or the research it supports, please feel free to contact me at the email listed above or my adviser, Dr. Dwayne Cartmell, at dwayne.cartmell@okstate.edu.** If you have questions about your rights as

a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

DEFINITION OF TERMS

In completing this questionnaire, please refer to the following definitions of terms from the Merriam-Webster Online dictionary:

Agriculture: The science, art, or practice of cultivating the soil, producing crops, and raising livestock and, in varying degrees, the preparation and marketing of the resulting products.

Social Media: forms of electronic communication (as Web sites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (as videos)

Smart phone: a cell phone that includes additional software functions (as e-mail or an Internet browser)

For the purpose of this study, please use the following definition of beef industry organization:

Beef Industry Organization: Any group, company, organization, or association whose primary purpose is to inform, support or promote the U.S. beef industry and the interests of producers within that industry.

Please rank the following methods of receiving information from most preferred (1) to least preferred (5).

- _____ Livestock Publications
- _____ Extension Specialists
- _____ Other Producers
- _____ Internet Sources
- _____ Social Media Tools

Please indicate which (if any) of the following social media tools you currently use, and estimate the number of hours per week you spend using each tool in the text boxes provided (select all that apply):

- Facebook _____
- Twitter _____
- LinkedIn _____
- Blogs _____
- YouTube _____
- Other _____
- I don't use any social media tools at this time.

I use social media tools (select all that apply):

- To access information regarding beef production, marketing, and herd management strategies.
- To access other agricultural information, such as market updates, crop conditions, and related agricultural news.
- To communicate with other producers in the beef and/or agricultural industries.
- For purposes not related to the beef industry and/or agriculture.
- Other _____

I access social media tools:

- Several times a day.
- Once a day.
- A few times a week.
- A few times a month.
- Less than once a month.

Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Receiving information from and interacting with friends/individuals via social media helps me feel more connected to those individuals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Receiving information from and interacting with other beef producers via social media helps me feel more connected to those producers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Receiving information from and interacting with beef industry organizations via social media helps me feel more connected with those organizations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how credible you believe information from each of the following sources is when received via social media tools:

	Never Credible	Rarely Credible	Neutral	Usually Credible	Always Credible
Information received from friends/individuals via social media is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information received from other beef producers via social media is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information received from beef industry organizations via social media is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rank the following sources of agricultural information from most credible (1) to least credible (5).

- _____ Livestock Publications
- _____ Extension Specialists
- _____ Other Producers
- _____ Internet Sources
- _____ Social Media Tools

What is your sex?

- Male
- Female

What is your age?

Select the highest level of education you have achieved.

- High School
- Associates Degree
- Bachelor's Degree
- Master's Degree
- Education Specialist
- Professional Degree
- Doctoral Degree

What is the average size of your operation in terms of head of cattle?

- Less than 100
- 100-249
- 250-499
- 500-999
- 1000+

What is your primary type of cattle operation?

- Seedstock
- Commercial Cow-Calf
- Stocker/Backgrounder
- Finisher
- Other _____

What is your role in the cattle operation?

- Owner/Operator
- Owner/Non-operator
- Herd Manager
- Herdsman/Ranch Hand

Are you employed in work outside of your cattle operation?

Yes (If selected, please describe your work outside the cattle operation below):

No

Do you have Internet access at your home or on your cattle operation?

Yes

No

Do you own a smart phone?

Yes

No

Answer If *Do you own a smart phone?* "Yes" Is Selected

In what ways do you use your smart phone (select all that apply):

- Send/receive phone calls.
- Send/receive text messages.
- Access e-mail.
- Access the Internet.
- Access social media tools.
- Other _____

I do not use social media tools at this time because (select all that apply):

- I don't know how.
- I don't have time.
- I don't have the tools (i.e., a computer or smart phone).
- I don't think it's important.
- I am not interested in using social media.
- Other Reasons _____

Answer If *I do not use social media tools at this time because* “I am not interested in using social media.” Is *Not Selected*

Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be interested in receiving information from and interacting with friends/individuals via social media tools.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be interested in receiving information from and interacting with other beef producers via social media tools.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be interested in receiving information from and interacting with beef industry organizations via social media tools.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Answer If I *do not use social media tools at this time because* “ I am not interested in using social media.” Is Not Selected

I would be interested in using social media tools (select all that apply):

- To access information regarding beef production, marketing, and herd management strategies.
- To access other agricultural information, such as market updates, crop conditions, and related agricultural news.
- To communicate with other producers in the beef and/or agricultural industries.
- For purposes not related to the beef industry and/or agriculture.
- Other _____

APPENDIX C

Panel of Experts

Robert Terry, Jr., Ph.D.
Professor and Head
Department of Agricultural Education, Communications, & Leadership
Oklahoma State University

Dwayne Cartmell, Ph.D.
Professor
Department of Agricultural Education, Communications, & Leadership
Oklahoma State University

David Lalman, Ph.D.
Professor and Beef Extension Specialist
Department of Animal Science
Oklahoma State University

Steve Suther
Director
Industry Information
Certified Angus Beef, LLC

Miranda Reiman
Assistant Director
Industry Information
Certified Angus Beef, LLC

Laura Nelson
Specialist
Industry Information
Certified Angus Beef, LLC

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

Kelly Gillespie, Ph.D.
Executive Director
Southwest Plains Regional Service Center

Carol Panzer
Educational Consultant
Southwest Plains Regional Service Center

APPENDIX D

Pilot Study E-Mail

Dear American Angus Association Board Members and Regional Managers,

You already serve the U.S. beef industry, but I hope you will take this opportunity to assist in a new area, a communications study! Completing this questionnaire should not take much of your time.

As a Master's student in agricultural communications and an advocate of the beef industry, I have an interest in how communication technologies may serve the U.S. beef industry and its producers. I am teaming up with the Certified Angus Beef Industry Information Division and Drovers/CattleNetwork in a research effort to determine U.S. beef producers' current use and perceptions of social media as a communications tool.

This is a pilot study and will serve to ensure the clarity of the survey instrument that will be used in this research. As part of a small pilot group, your input is greatly appreciated.

The link below will take you to a short questionnaire regarding your personal use and perceptions of social media. The questionnaire should take about 10-15 minutes to complete. At the end of the questionnaire, there will be a section for comments and questions. Please indicate in this section if there was anything throughout the questionnaire that was unclear.

Your assistance with this pilot study is greatly appreciated. If you have any questions regarding the content of the questionnaire or the research it supports, don't hesitate to contact me at the e-mail address provided below.

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher

E-mail: gillespie.agcmresearch11@gmail.com

APPENDIX E

Survey Pre-notification E-mail

Dear Drovers/CattleNetwork Subscriber,

In a few days, Jenny Gillespie, a researcher in agricultural communications, will be contacting you to participate in a national study regarding the current use and perceptions of social media in the beef industry.

Drovers/CattleNetwork is supporting this important research and we hope that you will participate. The results of this survey will help agricultural communicators and industry professionals better understand the communication preferences of U.S. beef producers. The e-mail you receive from Jenny will explain more about the importance of this research and your participation in the survey questionnaire.

Thank you in advance for your contribution to this communications research!

Sincerely,

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

APPENDIX F

First E-mail with Questionnaire Link

Dear Drovers/CattleNetwork Subscriber,

I need your help! As a master's student in agricultural communications and an advocate of the beef industry, I have an interest in how communication technologies may serve the U.S. beef industry and its producers. With the help of Drovers/CattleNetwork, I am working on a research project that will help determine how beef producers across the U.S. utilize social media tools to receive information and interact with other producers and organizations within the beef industry. With your assistance, the data collected will help agricultural communicators and industry professionals better serve you through developing communication strategies that fit your needs.

The link below will take you to a short questionnaire regarding your personal use and perceptions of social media. This questionnaire will take approximately 10-15 minutes to complete. Your assistance with this research is greatly appreciated. If you have any questions regarding the questionnaire or the research it supports, don't hesitate to contact me at the e-mail address provided below.

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher
gillespie.agcmresearch11@gmail.com

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

APPENDIX G

Reminder E-mail #1

Dear Drovers/CattleNetwork Subscriber,

I am sending this note as a reminder that I need your help! Last week I sent you the following message:

As a master's student in agricultural communications and an advocate of the beef industry, I have an interest in how communication technologies may serve the U.S. beef industry and its producers. With the help of Drovers/CattleNetwork, I am working on a research project that will help determine how beef producers across the U.S. utilize social media tools to receive information and interact with other producers and organizations within the beef industry. With your assistance, the data collected will help agricultural communicators and industry professionals better serve you through developing communication strategies that fit your needs.

This online questionnaire is only available for a short time, so please don't wait! In just 10-15 minutes, you could provide information that will help this research be a success. Participants who complete the questionnaire will be entered to win a box of premium steaks which will be awarded within a month of survey completion.

To access the questionnaire, simply click the link at the bottom of the page. If you have any questions regarding the questionnaire or the research it supports, don't hesitate to contact me at the e-mail address provided below. Thank you in advance for your time and participation!

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher
gillespie.agcmresearch11@gmail.com

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

APPENDIX H

Reminder E-mail #2

Dear Drovers/CattleNetwork Subscriber,

I am sending you this note as a **final reminder** that *I need your help!* Two weeks ago I sent you the following message:

As a master's student in agricultural communications and an advocate of the beef industry, I have an interest in how communication technologies may serve the U.S. beef industry and its producers. With the help of Drovers/CattleNetwork, I am working on a research project that will help determine how beef producers across the U.S. utilize social media tools to receive information and interact with other producers and organizations within the beef industry. With your assistance, the data collected will help agricultural communicators and industry professionals better serve you through developing communication strategies that fit your needs.

This online questionnaire will only be available for **one more week!** Your time and input are greatly valued and will help this research be a success. As a thank you, all participants who complete the questionnaire will be entered to win a box of premium steaks which will be awarded within a month of survey completion.

To access the questionnaire, simply click the link at the bottom of the page. It should only take 10-15 minutes to complete. Again, if you have any questions or concerns, I am happy to help! You may contact me at the e-mail address listed below.

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher
gillespie.agcmresearch11@gmail.com

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

APPENDIX I

Reminder E-mail #3

Dear Drovers/CattleNetwork Subscriber,

We have decided to extend the length of time that this online questionnaire is available. We are striving for a response rate that will provide usable data, and we still need more producers to provide input!

The main purpose of this research project, supported by Drovers/CattleNetwork and Oklahoma State University, is to determine U.S. beef producers' current use and perceptions of social media. Your responses are crucial in helping agricultural communicators and industry professionals understand your communication preferences so they can better serve you by developing communications strategies that fit your needs.

This questionnaire is very brief and should only take about 10-15 minutes to complete. To show our gratitude for your time, all participants who complete the questionnaire will be entered to win a box of premium steaks which will be awarded within a month of survey completion.

To take the questionnaire, simply click the link at the bottom of the page. Again, I am happy to answer any questions you might have regarding the content of the questionnaire or the research it supports. You may contact me at the e-mail address listed below.

I am excited to be working with such a reputable agricultural publication and I hope you will join us in our research efforts. We need your input to help make this research a success!

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher
gillespie.agcmresearch11@gmail.com

Greg Henderson
Editor/Associate Publisher
Drovers/CattleNetwork

APPENDIX J

Final E-mail Reminder

Dear Drivers/CattleNetwork Subscriber,

After the first extension of the online questionnaire, we saw an encouraging surge of responses from producers. We are hoping to get another surge before we close the questionnaire ***one week from today.***

For this purposes of this research, we will be contacting 10 percent of producers who do not respond to the online questionnaire via telephone. This will ensure the data collected can be applied to a larger population of U.S. beef producers. If you respond now, you will be removed from the call list of non-responders. In addition, all producers who participate in the online survey will be entered to win a box of premium steaks.

The main purpose of this research project, supported by Drivers/CattleNetwork and Oklahoma State University, is to determine U.S. beef producers' current use and perceptions of social media. Your time and input are greatly appreciated.

To take the questionnaire, simply click the link at the bottom of the page. It should only take a few minutes of your time. If you have any questions regarding the content of the questionnaire or the research it supports, you may contact me at the e-mail address listed below.

I am excited to be working with such a reputable agricultural publication and I hope you will join us in our research efforts. We need your input to help make this research a success!

Sincerely,

Jenny L. Gillespie
Agricultural Communications Researcher
gillespie.agcmresearch11@gmail.com

Greg Henderson
Editor/Associate Publisher
Drivers/CattleNetwork

APPENDIX K

Phone Survey Script

Hello, may I speak to (name from panel list)?

Hi, my name is (caller's name). I am calling regarding an online questionnaire you may have received via e-mail between August 24th and September 18th. Do you have a few minutes to learn about this graduate research project?

This survey, which examines U.S. beef producers' use and perceptions of social media, is part of a graduate research project in agricultural communications. You were selected as one of the producers to be involved in this study through your membership with Drovers/CattleNetwork, which is supporting the research.

Although the online questionnaire is now closed, we are following up with phone calls to some of the producers who did not respond to the Web-based instrument. Your participation in this study is important to its success, and will help agricultural communicators and industry professionals better understand your use and interest in social media as a communications tool.

This questionnaire consists of 18 questions regarding your current use (or non-use) of social media, your perceptions of information received via social media tools, and some demographic information. It should only take about 10 minutes to complete. Would you be willing to participate in this graduate research study?

(Negative response): I understand. Thank you for your time.

(Positive response): Thank you. Your time and participation are appreciated. We will get started with the questionnaire, but if at any point you have a question regarding the survey or the research it supports, feel free to ask.

[ADMINISTER QUESTIONNAIRE.]

That concludes the questionnaire. Do you have any questions for me?

Thank you again for your time. Would you like the contact information for the primary researcher of this study, in case any questions come up?

(Negative response): Ok, thank you for your time and have a nice evening!

(Positive response): Ok, the e-mail address is gillespie.agcmreserach11@gmail.com. Thank you for your time and have a nice evening.

VITA

Jenny L. Gillespie

Candidate for the Degree of

Master of Science

Thesis: U.S. BEEF PRODUCERS' CURRENT USE AND PERCEPTIONS OF
SOCIAL MEDIA AS A COMMUNICATIONS TOOL

Major Field: Agricultural Communications

Biographical:

Personal Data:

Born in Liberal, Kansas on September 8, 1986, the daughter of Gary and Kelly Gillespie.

Education:

Graduated from South Gray High School, Montezuma, Kansas in May 2005.

Received Bachelor of Science degree in Agribusiness from Kansas State University, Manhattan, Kansas in December, 2009.

Completed the requirements for the Master of Science degree in Agricultural Communications at Oklahoma State University, Stillwater, Oklahoma in December, 2011.

Experience:

Completed a writing internship with the Certified Angus Beef Industry Information team from August – December 2011.

Served as the student editor for the *Journal of Applied Communications* from May – December 2011.

Employed as a graduate teaching assistant in Agricultural Communications at Oklahoma State University from August 2010 – December 2011.

Completed a summer internship with SUNUP, a state-wide agricultural television program produced by Oklahoma State University's Ag Communication Services from May – August 2011.

Served as a special projects intern with the U.S. Department of Agriculture in the Office of the Executive Secretariat from March – August 2010.

Name: Jenny L. Gillespie

Date of Degree: December, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: U.S. BEEF PRODUCERS' CURRENT USE AND PERCEPTIONS OF
SOCIAL MEDIA AS A COMMUNICATIONS TOOL

Pages in Study: 104

Candidate for the Degree of Master of Science

Major Field: Agricultural Communications

Scope and Method of Study:

The purpose of this nationwide study was to determine U.S. beef producers' current use and perceptions of social media as a communications tool. Participants in this study (n=498) were randomly selected from a population of 6,201 beef producers who: (a) belonged to Drovers/CattleNetwork in 2011; (b) had a valid e-mail address on account with the publication; and (c) had not opted-out of third party contact. Descriptive research methodology was selected for this study to analyze not only the trend of social media use among U.S. beef producers, but also the relationships between various attributes of those producers as they relate to communication preferences, social media use, and perceptions of information shared via social media tools. Descriptive statistics and cross tabulations were used to analyze the data.

Findings and Conclusions:

This population of U.S. beef producers indicated a strong preference for livestock publications as their primary source of information, followed closely by the Internet. Livestock publications also received the highest credibility ratings from producers, followed by Extension specialists. Social media was rated as both the least preferred and the least credible source of information in this study. However, producers did indicate information shared via social media tools by other producers and beef industry organizations as usually credible. About half of producers were currently using social media tools, largely for reasons related to the beef and agricultural industries. Producers not using social media indicated time and lack of interest as the major factors contributing to their non-use.

ADVISER'S APPROVAL: Dr. D. Dwayne Cartmell II
